ACIL ALLEN

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Report to Department of Industry, Science, Energy and Resources

Industry Growth Centres Initiative

Initial Impact Evaluation

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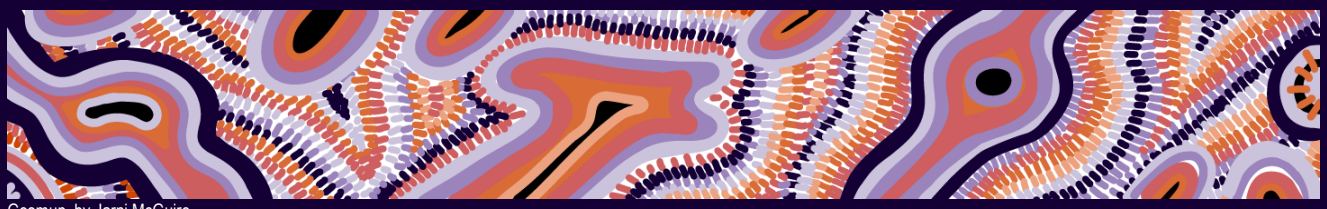

Goomup, by Jarni McGuire

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Glossary

ABS	Australian Bureau of Statistics
AMGC	Advanced Manufacturing Growth Centre
ANDHealth	Australia's National Digital Health Initiative
ANZSIC	Australia and New Zealand Standard Industrial Classification
ARC	Australian Research Council
ARCS	Association for Research and Clinical Scientists
ASIC	Australian Securities and Investments Commission
AustCyber	Cyber Security Growth Centre
BCS	Business Characteristics Survey
BHERT	Business Higher Education Round Table
BLADE	Business Longitudinal Analysis Data Environment
BMTH	BioMedTech Horizons
BTB	Biomedical Translation Bridge
CRC	Cooperative Research Centre
CRC-P	Cooperative Research Centre Projects
CRI	Commercial Readiness Index
CSA	Coordination Structure Assessment
Department	Department of Industry, Science, Energy and Resources
DoH	Department of Health
EOR	Enhanced Oil Recovery
EP	Entrepreneurs' Programme
Evaluation, the	Initial Impact Evaluation
FIAL	Food Innovation Australia Limited
GCs	Growth Centres
GCAC	Growth Centre Advisory Committee

ICMM	International Council on Mining and Metals
IGCI	Industry Growth Centres Initiative
IICA	Industry, Innovation and Competitive Agenda
IMARC	International Mining and Resources Conference
IMNIS	Industry Mentoring Network in STEM
IRC	Industry Reference Committees
IISA	Industry, Innovation and Science Australia
ISA	Innovation and Science Australia
ISF	Industry Skills Fund
ITRP	Industrial Transformation Research Program
LFA	Logical Framework Analysis
METS Ignited	Mining Equipment, Technology and Services Growth Centre
MMS	Modern Manufacturing Strategy
MRFF	Medical Research Future Fund
MTAA	Medical Technology Association of Australia
MTP	Medical Technologies and Pharmaceuticals
MTPConnect	Medical Technologies and Pharmaceuticals Growth Centre
NERA	National Energy Resources Australia Growth Centre
PPPs	Public Private Partnerships
R&D	Research & Development
REDI	Researcher Exchange and Development within Industry
SCP	Sector Competitiveness Plan
SIA	Strategic Innovation Agenda
SIPs	Strategic Innovation Programs
SMART	Specific, Measurable, Achievable, Realistic, and Timely
SMEs	Small and medium enterprises
STEM	Science, Technology, Engineering and Mathematics
TGA	Therapeutic Goods Administration
TIS	Technological Innovation System
TKI	Alliance for Knowledge and Innovation
TRL	Technology Readiness Level
VET	Vocational Education and Training

Executive summary

The Australian Government's 2014 *Industry, Innovation and Competitiveness Agenda (IICA)*[1] positioned industry to build innovation capacity, commercialise and apply emerging technologies, and increase productivity. The Agenda aimed to secure Australian industry's competitive standing in the global economy.

The Industry Growth Centres Initiative's (IGCI) introduction in 2014 formed the centrepiece of the Agenda.[2] It was designed on the principle that government is best placed to coordinate policy and programs to achieve impact within and across sectors, and industry is best placed to drive cultural change and overcome barriers to innovation, productivity and growth.[3]

The IGCI has funded the establishment of six independent Growth Centres (GCs) in sectors of comparative advantage and strategic priority. These are:

— Advanced Manufacturing (AMGC)
— Cyber Security (AustCyber)
— Food and Agribusiness (FIAL)
— Medical Technologies and Pharmaceuticals (MTPConnect)
— Mining Equipment, Technology and Services (METS Ignited)
— Oil, Gas and Energy Resources (NERA).

Initial funding for the IGCI was $188.5 million over four years, after which the GCs were expected to become self-sustaining. However, recognising the initial slow start to establishment, a two-year extension of $60 million was provided in 2018, bringing the total funding to $255 million.

Through their activities, each GC is required to meet the following four core objectives:

1. Improving engagement between research and industry, and intra-industry engagement to improve collaboration and commercialisation outcomes
2. Improve GC's capability to engage with international markets and access global supply chains
3. Identify unnecessary regulations for GCs that hinder growth and address reform
4. Improve management and workforce skills in GCs.

[1] Commonwealth of Australia (2014). *Industry Innovation and Competitiveness Agenda: An action plan for a stronger Australia*. Canberra: Australian Government.

[2] Department of Industry (2014). Op. cit.

[3] Department of Industry, Science, Energy and Resources (2020). *Industry Growth Centres*. Accessed 26 February 2020: https://www.industry.gov.au/strategies-for-the-future/industry-growth-centres.

In the 2020-21 Federal Budget the Australian Government announced a $1.5 billion Modern Manufacturing Strategy (MMS).[4,5,6] The MMS is designed to be led by industry, for industry and to build scale, competitiveness, resilience, value and agility in Australia's manufacturing and supply chains.

The MMS is focussed on six National Manufacturing Priorities: Resources Technology & Critical Minerals Processing, Food & Beverages, Medical Products, Recycling & Clean Energy, Defence and Space.

As part of the MMS, $20 million was awarded to support the operating and administration costs of AMGC, FIAL, METS Ignited and MTPConnect to the end of 2021-22. An additional $30 million was awarded to AMGC over two years to support the commercialisation of new ideas in consultation with the other GCs. The GCs have also been asked to align their activities to support the MMS.

Impact evaluation

In November 2019, the Department of Industry, Science, Energy and Resources (the Department) commissioned this Initial Impact Evaluation (the Evaluation) of the IGCI. The Evaluation focused on medium-term outcomes to:

a) better understand how each Growth Centre (GC) prioritises and responds to growth opportunities and threats
b) determine whether the IGCI is achieving impact.[7]

The findings of the Evaluation will inform current and future industry flagships programs and support the Minister's consideration of the longer-term future of the IGCI beyond June 2022.

The Evaluation considered the GCs' individual objectives and work plans, the presence of different inputs and outputs and the performance of GCs and the IGCI. The Evaluation's scope included an assessment of the IGCI's:

— *Appropriateness*, which included analysis of its rationale and alignment with the strategic objectives of Government, as well as its comparability with similar initiatives in selected countries
— *Efficiency*, which included analysis of its administration, monitoring and evaluation (performance measurement) arrangements and the level of cooperation between agencies involved in, or related to the IGCI
— *Effectiveness*, which included analysis of its performance, progress towards outcomes, and the obstacles encountered in its implementation.

The Evaluation also leverages a detailed qualitative evaluation methodology developed by an external expert, Dr Matthijs Janssen of Utrecht University, the Netherlands. The approach explores the extent to which the IGCI's actions and investments are likely to build innovation capacity, and whether any changes to the performance of organisations which participate in a GC can be attributed to the IGCI.

The Evaluation was informed by a detailed desktop review, international comparisons, more than 150 stakeholder consultations, and surveys (788 responses were received from GC participants). The approach was modified to reduce the burden on survey recipients, many of whom faced major challenges during the COVID-19 pandemic of 2020. Stakeholder consultations were conducted from June to September 2020, with the surveys active between mid-July and mid-August 2020. As such, stakeholder views were obtained prior to the delivery of the 2020-21 Australian Government Budget on 6 October 2020, and do not reflect the announcements in the context of that Budget, including the MMS.

[4] Australian Government (2020). *Transforming Australian Manufacturing to Rebuild our Economy*. Media Release, Prime Minister, Minister for Industry Science and Technology: 1 October 2020. Accessed 6 November 2020: https://www.pm.gov.au/media/transforming-australian-manufacturing-rebuild-our-economy.

[5] Morrison, S. (2020). *A Modern Manufacturing Strategy for Australia*. Speech at the National Press Club, ACT, 1 October 2020. Accessed 9 November 2020: https://www.pm.gov.au/media/modern-manufacturing-strategy-australia-national-press-club-act.

[6] The Treasury (2020). *Budget 2020-21: Economic Recovery Plan for Australia, Overview*. Canberra: Australian Government.

[7] We note that administration was addressed as part of previous evaluations. As such, and on advice from the Department, previous evaluations will be the primary evidence base for identifying issues relating to the IGCI's administration.

The Evaluation is complemented by Departmental quantitative impact assessment using BLADE data.[8] It assessed the IGCI's impact on the performance of participating businesses relative to a constructed control group to provide an important sense of the counterfactual.

Key Findings

Overall, the Evaluation has identified ample evidence to suggest that the IGCI is supporting Australian industries to become more competitive, resilient and sustainable. The evidence for this comes from the stakeholder consultations and surveys. The precept of using an industry-led approach to support industries which demonstrate competitive, comparative, or strategic advantage, is sound and consistent with other top performing OECD nations, such as the UK, the Netherlands and Sweden. The feedback from more than 150 stakeholders (collected prior to the announcement of the MMS) suggested the IGCI is valued and has significant potential to deliver long-term value.

GCs are starting to deliver impact, and this is expected to increase in the future (with some GCs showing greater impact potential than others). Stakeholders believe that there is a strong case for the IGCI to continue. They note that the GCs were asked to develop ten-year strategies. These strategies are just starting to yield promising results. This is supported by the Department's analytical evidence.

Overall, the analysis suggests that the four IGCI objectives are being addressed by the GCs with many prospective outcomes, although with less attention to objective 4 (identifying opportunities for regulatory reform).

More detail on performance is provided in Chapters 2-6 of this Evaluation Report. Some of the highlights include:

— The GC design choices have supported their industries by being open, change-focused, leadership-oriented, adaptable and outcome inclusive. In doing so they have embraced flexibility by implementing sector-specific, customised work programs, which they have adjusted as needed using processes of on-going review.

— GC's have succeeded in leveraging funding from the private sector and government, securing at least matching contributions from recipients of their Project grants. One GC (MTPConnect), has been commissioned to receive $150 million funding from the Australian Government Department of Health to work with others to achieve outcomes under four Medical Research Future Fund funding programs. The outcomes of these programs align well with MTPConnect's objectives and will provide significant support for that sector. Some stakeholders spoke of success in raising capital, with one reporting that assistance from a GC had led to raising more than $200 million.

— The GCs have extensive networks and expertise, the value of which was demonstrated in their agile, collaborative response to the COVID-19 pandemic.

— All GCs have addressed Dr Janssen's Technological Innovation System (TIS) framework elements (entrepreneurial experimentation, knowledge development, knowledge exchange, guiding direction of research, market formation, and resource mobilisation). The relative need and importance of each element generally correlates with the level of effort the GCs have made. As a result of these inputs, the GCs have achieved solid results across the TIS elements.

— While it is too soon to assess the magnitude of the changes that have occurred, ACIL Allen considers that the GCs have aimed high and the magnitude of their impact is likely to be large.

— The GC's have improved outcomes for the businesses they have engaged with. The Department's complementary analysis of the IGCI quantitatively demonstrates that GC-associated businesses are more likely to engage in R&D and be more innovative, have more active trademarks, be registered with the RDTI program, be trade exposed, and show improved business performance in turnover, wages and employment growth.

However, delays to the IGCI's establishment and early operations have impacted on realising the program's potential. There are also a number of areas in program management and design where improvements are required:

— The extent of a GC's impact against objectives 1-3 has been constrained by their personal networks, staff expertise, and funding. In particular, the GC's lack the resourcing and structures to drive transformational change at a sectoral level.

[8] Office of the Chief Economist (2020). *The impact of Industry Growth Centre participation on firm performance*. Canberra: Department of Industry, Science, Energy and Resources, Office of the Chief Economist.

- The GCs have made somewhat less progress towards objective 4 (regulatory reform). That said, GCs have worked with their stakeholders on regulatory issues, such as the recent encryption legislation; streamlining regulations governing clinical trials and approvals, development and use of digital devices in the MTP sector; achieving greater harmonisation between Australian and International oil and gas industry standards; social-license-to-operate reforms and harmonisation of safety standards and site inductions standards in the METS sector; and reducing the cost of food safety audits for the food and agriculture sector.
- The roles and responsibilities of government in an industry-led initiative present some challenges and have created confusion. The IGCI is currently overseen by the Department, the independent GCAC and the individual GC Boards (which must be responsive to their industry stakeholders and collaborators). This complicates reporting requirements, which appear overly demanding on financial reporting (a requirement under the funding agreement) but lacking in data on outcomes and impact.
- Some conflict-of-interest concerns have been raised about the role of GC's in both assisting applicants for grants from other government programs and then providing advice to selection committees. Even if these issues of conflict are more perceived than real, they need to be better managed in the future.
- Performance measurement continues to be a significant challenge. This is complicated by a range of external (e.g. the long-term approaches of each GC, the lag time to impact, and the intangible benefits delivered by the GCs), and internal factors (e.g. delay in implementing IGCI and GCs Program Logics/data collection strategies, allowing the GCs the flexibility to undertake different work programs and to develop different objectives and performance measures). This means that more consistency is required in this area of the IGCI's administration.
- In this context it is sometimes difficult to develop a clear line of sight between the IGCI and the objectives pursued by some GCs through their activities. The Program Logics, developed by the GCs and the Department in the past 1-2 years, help improve this line of sight to some extent. However, it is difficult to look across GC activities and easily link all the activities to the IGCI objectives.
- The IGCI's (and individual GC's) current performance and monitoring framework need reworking. Its data collection framework has not been consistently adopted or followed by the GCs. The IGCI's governance model also requires improvement to help drive the longer-term performance and accountability of GCs and improve integration and alignment of the program with the Government's industry, science and technology policy agenda.
- There is some confusion amongst firm-level stakeholders, innovation system leaders and research leaders consulted for the Evaluation about where the IGCI's boundaries begin and end. These stakeholders believed that the IGCI can better meet the Government's objectives if the boundaries between it and other Australian Government programs (including those under the Innovation and Science Australia (ISA) remit) are clarified and communicated.

Lessons learned and looking ahead

The MMS has reset the landscape for manufacturing policy, both in terms of ambition and scale. To identify opportunities to support the MMS, the Department has been asked to review existing programs, including the IGCI, and each of the GC's have been asked to review their activities. GCs should be in a position to contribute to the MMS given that four of the GCs directly relate to counterpart National Manufacturing Priorities and two cross cutting GC's (AMGC and AustCyber) contribute to outcomes across all National Manufacturing Priorities. The realignment also provides an opportunity for several of the recommendations of the Evaluation to be taken up in a holistic way.

The future of the IGCI and GC's is a matter for government and outside the terms of reference of the Evaluation. However, the review of program alignment against new priorities would seem to be a timely opportunity for thought to be given to the next stage of the IGCI. In this context there are a number of observations, or lessons learned, which may be relevant.

First, a flexible, industry-led program can be a powerful tool and clearly has a place within the innovation ecosystem. However, the IGCI's funding envelope is small relative to that of comparable international programs such as the UK's Catapult Program and there is now the MMS with its larger funding opportunities. If they are to maintain relevancy in the new environment, it may be opportune for the existing GC's to reframe their value offering drawing on their networks and knowledge/people/project asset base and focus on investments which will deliver the greatest comparative and competitive advantages to the sectors they operate in.

Second, achieving real progress and sector-wide change takes time. While the GCs have had around five years to build momentum, credibility and trust, this has been slower than anticipated. Providing further opportunity for the GCs to deliver on their strategies, which have a ten-year planning horizon, will enable longer term benefits to be realised.

Third, a flexible industry-led program like the IGCI must plan for the benefits it will deliver and design its evaluation requirements accordingly. Better utilisation of Program Logics, data collection frameworks and KPIs by the GC's will assist in managing performance and identifying beneficial impacts. The funding extensions provide an opportunity for the GCs and the Department to pursue regular and more meaningful reporting.

Fourth, the IGCI must have effective governance and support to drive its longer-term direction and/or coordination with other government programs. The IGCI's governance arrangements should ensure active management of GC performance by requiring performance management in future funding agreements, to build confidence in the IGCI and deliver maximum value from it. As part of the announcement of the MMS, the reinvigorated Industry, Innovation and Science Australia (IISA) has been established to inform and guide policy on industry, science and research and advocate and champion Australia's innovation, science and research system. This presents an opportunity to improve the IGCI's governance arrangements.

Lastly, many stakeholders consulted (including those with innovation system leadership responsibilities) believe that additional funding is required to help GCs scale, reach a diverse audience and achieve impact towards the IGCI objectives. The MMS through it various funding streams is expected to create opportunities for driving scale in manufacturing in a way that the GC's, at current funding levels, cannot.

The intention is for the GC's to transition from IGCI funding to alternative sources. In ACIL Allen's view, noting that none of the international comparators operate on purely private sector funding, it is unlikely the GCs will become self-sustaining. It may be possible that a public/private funding model will provide a transitional platform.

Evaluation limitations

It is important to note the limitations of this Evaluation. First, quantitative GC-level data on outcomes and impacts was limited or patchy, forcing the Evaluation to rely heavily on qualitative stakeholder consultation and survey data. These data gaps limited the Evaluation's ability to consistently track and measure outputs and outcomes across the GCs. Such inconsistency has also been experienced by the UK Catapults. Second, GC Performance Frameworks (including key performance indicators) have not been fully implemented as intended. The Evaluation observed a lack consistency between GC Business Plans and the IGCI Evaluation Data Framework, and a tendency of GC's reporting to focus on activities and operational performance rather than outcomes and impact. This has limited the ability of the Evaluation to assess the IGCI as a whole.

Recommendations

This Evaluation makes eight recommendations. The recommendations seek to enhance the design arrangements, processes, impacts and evaluation readiness of the IGCI over time. The recommendations are offered with a distinct logic, which reflects the ambitious scope of the IGCI (i.e. to achieve lasting sectoral change), the prize for delivering against that scope (i.e. improved productivity and competitiveness), and the resource and capacity limitations that are a reality for all Government programs. These recommendations are based on a presumption of program continuance largely in its current form.

It is critical in a resource constrained environment that the IGCI and GCs are focused on actions and investments that deliver the most value to stakeholders. Recommendations 1-3 are designed to provide the means by which the IGCI and GCs can achieve greater focus in areas that will deliver the greatest benefit. By focus, we refer to the need to focus on actions/investments that are more appropriately aligned with a GC's 'span of control' and the need for clear boundaries between the IGCI and other Government programs. It is important that these boundaries are clear so that a unique proposition can be consistently articulated to GC target firms, and other GC stakeholders and collaborators.

Once the IGCI is focused, it is then important to consider the arrangements which will help to drive the performance and accountability of GCs over the long term. To this end, recommendations 4-7 seek to enhance the IGC's governance model, performance framework and reporting.

Finally, there are some steps that Government can take to improve the IGCI's evaluation readiness prior to the next scheduled evaluation in 2023-24. These steps include addressing many of the GC data gaps identified in the Evaluation as well as refining and then re-running the GC stakeholder survey developed for this project on a regular basis. They are the focus of Recommendation 8.

Objectives, strategies and boundaries

Recommendation 1: Ensure all GC objectives align with the IGCI objectives

Noting that the GCs have been asked to realign and refocus their activities to support delivery of the MMS and contribute to outcomes aligned with the National Manufacturing Priorities, the IGCI objectives are sufficiently broad to enable the GCs the flexibility to do so and address the opportunities and barriers to growth in each sector. All GC objectives should be clearly aligned with an IGCI objective and aim to maximise value to the economy. GC objectives should be clearly stated, documented and consistently communicated to ensure a measurable, long-term strategic focus that minimises the impact of short-term policy changes.

Recommendation 2: Ensure GC's are focused on supporting businesses through TRLs stages 4-7 and CRI 1

GCs should be focused on developing strategies and delivering activities that play to their unique position within the innovation/commercialisation ecosystem. There should be clear boundaries between the IGCI and other Government programs (which typically have greater resources and capacity to achieve outcomes). To this end, it is recommended that the GCs are asked to be guided by technology readiness levels (TRLs) and the commercial readiness index (CRI) to focus their activities and business support. GCs should focus mainly on supporting activities at TRLs 4-7 and CRI 1.

Recommendation 3: Clarify the boundaries between the IGCI and IISA's other industry-based innovation and commercialisation programs

The IGCI was implemented outside the then ISA's remit of complementary innovation and commercialisation programs. The boundaries between the programs remain unclear to many stakeholders consulted. Defining the IGCI's role in relation to innovation and commercialisation programs through program realignment will clarify its focus in the new policy landscape. There is value in clarifying the pathways or relationships between the IGCI and other programs using the TRLs and CRI. It is important that all programs which provide innovation and commercialisation services to firms have clear boundaries and have processes in place which channel participants to, and from GCs on a systematic basis.

The establishment of the IISA also presents an opportunity to improve the IGCI's governance arrangements.

Governance and performance management

Recommendation 4: Strengthen IGCI governance/oversight

Programs of the IGCI's scale, size, complexity and importance require dedicated senior official support and active oversight by a strong governance committee. Stakeholders believe that there is a need for more effective governance of the IGCI, with greater oversight of GC direction setting, performance monitoring and risk management.

The announcement of the MMS and funding extension under the 2020-21 Federal Budget provide the opportunity to improve the IGCI's governance arrangements under the IISA.

Recommendation 5: Improve program KPIs

It has been evident from the Evaluation that the current KPIs do not provide information which demonstrates the overall performance of the IGCI or individual GCs. Following the announcement of the MMS the GC's have been asked to report on specific KPIs and this presents an opportunity for the IGCI develop a smaller number of meaningful KPIs which are based on the Specific, Measurable, Achievable, Realistic, and Timely (SMART) criteria and other best practices in the field of innovation, drawing on indicators used in the UK Catapults Performance Framework.

The core data sets that underpin KPI measurement need to include details of companies assisted (e.g. ABN, contact details) and the nature of the assistance provided. This will allow the use of BLADE to see how these companies have performed by comparison with sectoral averages or with businesses having similar characteristics. Outcome data to be collected by GCs needs to include funds leveraged (whether for R&D or other activities), funds raised by assisted start-ups and fast-growing SMEs, numbers and value of collaborations, jobs created, patents and licences, outcomes of training sessions provided, new products and services introduced. With this information, other measures such as increases in turnover and exports can be derived using BLADE.

Recommendation 6: Embed improved KPIs within the operations of GCs

GCs should embed KPI performance management into their organisations, where this is not already occurring. This will involve clearly, transparently and consistently communicating strategy/priorities and related KPIs. There is a need for a clear focus on performance orientated KPIs as opposed to activity indicators (which are what are currently being reported by most GCs). It also involves assigning clear accountability for KPIs and reviewing their progress through regular performance monitoring. The GCs should be required to include a section in their annual Business Plans setting out how they intend to measure the outcomes and impacts of the activities they are planning to undertake in that year.

Recommendation 7: Improve the management of GC performance assessed against KPIs

Further to Recommendation 3, it is important that any poor or unsatisfactory GC performance is appropriately managed. The extension of funding and revised IISA arrangements provide the opportunity to require performance management according to KPIs and link performance with funding.

Three criteria for managing poor GC performance are offered under this recommendation.

Criterion 1: managing poor or ineffective leadership. Where a GC has poor or ineffective leadership (due to poor board performance, a high rate of leadership turnover, etc) which impacts its ability to set an appropriate direction or execute it in a timely way, then the IGCI's governance/management arrangements should resolve these issues.

Criterion 2: ensuring alignment with IGCI's objectives. GCs in receipt of Government funding must demonstrate strong alignment between their actions/investments and each IGCI objective. Where alignment is weak, and Government money has been expended, then GCs must provide an adequate explanation for their actions and the IGCI's governance/management arrangements must have the ability to take remedial action to ensure strong alignment in the future.

Criterion 3: performance reporting and business plans. Based on recommendations 5 and 6, the IGCI's governance/management arrangements must include reviews of GC KPIs and business plans so that any unsatisfactory performance or progress can be addressed.

Evaluation readiness

Recommendation 8: Improve the IGCI's evaluation readiness

Ideally the IGCI should be evaluation ready, but it is not. Key data are missing across the GCs. There is limited appetite amongst some GCs to address data issues and to become more evaluation ready in the future. Considerable effort is required to improve the future evaluation readiness of the IGCI (i.e. improved data collection and performance measurement, with a focus on quantifying impact).

This recommendation requires the Department and GCs to address all the data issues and gaps (or as many as reasonable within the timeframe) identified in this report and to improve the consistency and completeness of existing data sets. In some instances, it may require GCs to backward map data into the frameworks and categories required to measure the impact of their various activities, as suggested by Dr Janssen.

This recommendation includes the development of an annual survey of GC participants (which builds on and extends the survey developed by ACIL Allen) to provide increased consistency and to understand the impacts of GC activities against the four IGCI objectives.

Under the funding extensions, strengthened GC and Departmental reporting can aim to drive improved oversight and accountability. ACIL Allen believes this will support improved evaluation readiness.

1 Introduction

1.1 Purpose

The Department of Industry, Science, Energy and Resources (the Department) commissioned this Initial Impact Evaluation (the Evaluation) of the Industry Growth Centres Initiative (IGCI) in November 2019.

The Evaluation focused on medium-term outcomes. The findings of the Evaluation will inform the delivery of ongoing and future Industry Flagships Programs.

The Evaluation was delivered in two phases:

— Phase 1 involved the development of a qualitative evaluation methodology by an external expert, Dr Matthijs Janssen of Utrecht University, Netherlands. Dr Janssen evaluates and advises on implementing policy measures.

— Phase 2 involved the operationalisation of the largely qualitative Phase 1 methodology. Quantitative firm-level analysis has been conducted by the Department to support the Phase 2 analysis.

When the analysis for the Evaluation was nearing completion, the Australian Government delivered the 2020-21 Federal Budget. The Evaluation report (this document) has been revised to note new policy settings, changes to the new Industry, Innovation and Science Australia (IISA), and to focus on informing the long-term future of the IGCI (beyond June 2022) and other relevant initiatives in the context of the newly announced Modern Manufacturing Strategy (MMS).[9,10,11]

1.2 Context

The Australian Government's 2014 *Industry, Innovation and Competitiveness Agenda (IICA)*[12] aimed to position industry to build innovation capacity, commercialise and apply emerging technologies, and increase productivity. This sought to secure Australian industry's competitive standing in the global economy. The IICA identified four overarching ambitions to achieve these aims:

— a lower cost, business-friendly environment with less regulation, lower taxes, and more competitive markets

— a more skilled labour force

— better economic infrastructure

— industry policy that fosters innovation and entrepreneurship.

[9] Australian Government (2020). Op. cit.

[10] Morrison, S. (2020). Op. cit.

[11] The Treasury (2020). Op. cit.

[12] Commonwealth of Australia (2014). Op. cit.

The IGCI was established to be the centrepiece of this Agenda.[13] It was designed on the principle that government is best placed to coordinate policy and programs to achieve impact within and across sectors, and industry is best placed to drive cultural change and overcome barriers to innovation, productivity and growth.[14]

The IGCI was intended to bridge government, industry and research, and align with existing policy initiatives to address productivity, competitiveness, and innovation needs and scale and impact:[15]

> *The role of any government is to create the right conditions and activate the right economic drivers to unburden the private sector and enable it to thrive.*
>
> *Industry Growth Centres Prospectus*

The IGCI has funded the establishment of six independent Growth Centres (GC) in sectors of comparative advantage and strategic priority, namely:

- Advanced Manufacturing, known as the Advanced Manufacturing Growth Centre (AMGC)
- Cyber Security, known as AustCyber
- Food and Agribusiness, known as Food Innovation Australia Limited (FIAL)
- Medical Technologies and Pharmaceuticals, known as MTPConnect
- Mining Equipment, Technology and Services, known as METS Ignited
- Oil, Gas and Energy Resources, known as National Energy Resources Australia (NERA).

The IGCI supports the *National Innovation and Science Agenda* (2015),[16] and complements the Growth Fund (then $155 million) and National Manufacturing Transition Programme (then $50 million). It builds on the $484.2 million Entrepreneurs' Programme.[17]

The context and rationale for the IGCI is further discussed in Section 2.1. The IGCI's role among other innovation policies and programs is considered throughout the report.

1.2.1 The Australian Government's Modern Manufacturing Strategy

The Australian Government's $1.5 billion MMS was announced in the 2020-21 Federal Budget.[18,19,20] The Vision of the MMS is "For Australia to be recognised as a high-quality and sustainable manufacturing nation that helps to deliver a strong, modern and resilient economy for all Australians". This will be delivered through four pillars, which will support Australia's six National Manufacturing Priorities, outlined in Box 1.1.

As outlined in the MMS, manufacturing is a key part of almost every supply chain and contributes significant value to all sectors. The MMS is designed to be led by industry, for industry. This will build scale, competitiveness, resilience, value and agility in Australia's manufacturing and supply chains.

[13] Department of Industry (2014). Op. cit.

[14] Department of Industry, Science, Energy and Resources (2020). *Industry Growth Centres*. Accessed 26 February 2020: https://www.industry.gov.au/strategies-for-the-future/industry-growth-centres.

[15] Office of the Chief Economist (2016). *Industry Growth Centres Initiative Post-Commencement Evaluation*. Canberra: Australian Government.

[16] Australian Government (2015). *National Innovation and Science Agenda*. Canberra: Australian Government.

[17] Australian Government (2014). *Growth Centres to boost competitiveness, joint media release by the Hon Tony Abbott MP, Hon Ian Macfarlane MP and Hon Karen Andrews MP*. Accessed 4 June 2020: https://www.minister.industry.gov.au/ministers/macfarlane/media-releases/growth-centres-boost-competitiveness.

[18] Australian Government (2020). Op. cit.

[19] Morrison, S. (2020). Op. cit.

[20] The Treasury (2020). Op. cit.

Growth Centres Funding Extensions (2020-21 Federal Budget)

As part of the 2020 Federal Budget an additional $30 million was awarded to AMGC over two years from 2020-21 to support projects to commercialise new ideas, with:

— the funding to continue to build the capability and the competitiveness of the manufacturing sector, including through grants of up to $1 million
— grants to be matched by recipients
— AMGC to work in consultation with other GCs to support priorities that align with the National Manufacturing Priorities and Roadmaps.

In addition, $20 million was awarded to support FIAL, METS Ignited and MTPConnect operating and administration costs for 2021-22.

The funding contracts for AMGC, FIAL, METS Ignited and MTPConnect were due to expire between the period June-November 2021. No operational funding was announced for NERA or AustCyber as their current funding agreements extend to or past June 2022.

The funding extensions align the funding agreements of all GCs to at least June 2022. These extensions will not be business as usual. Under the funding extensions, the GCs will support the implementation of the MMS in the immediate term and contribute to outcomes aligned with the National Manufacturing Priorities. The GCs will be asked to make some changes, including:

— realigning and refocussing their activities to support delivery of the MMS
— improving regular and meaningful reporting, including reporting on specific KPIs.

Box 1.1 The Australian Government's Modern Manufacturing Strategy

The MMS's four pillars:
— getting the economic conditions right for business
— making science and technology work for industry
— focusing on areas of advantage
— building national resilience for a strong economy.

Australia's National Manufacturing Priorities
— Resources Technology & Critical Minerals Processing
— Food & Beverage
— Medical Products
— Recycling & Clean Energy
— Defence
— Space.

The MMS aims to achieve the following goals by working closely with industry:
— 2 years: Create the business environment to support manufacturing jobs and encourage new investment
— 5 years: Support a more industry-focused science and technology system which helps boost productivity, scale and competitiveness
— 10 years: Lock in productive and competitive firms with high impact sectoral growth.

Key initiatives
— $1.3 billion Modern Manufacturing Initiative: Will transform manufacturing businesses and help them to scale-up, translate ideas into commercial successes and integrate into local and international value chains.
— $107.2 million Supply Chain Resilience Initiative: Will help Australia address identified gaps in critical supply chains.
— $52.8 million Manufacturing Modernisation Fund round two: Will deliver quick action to unlock business investment in shovel-ready projects.

Source: Department of Industry, Science, Energy and Resources (2020): Make It Happen, The Australian Government's Modern Manufacturing Strategy. Canberra: Australian Government.

1.2.2 The Department's Evaluation requirements

The Department's Evaluation Strategy guides the consistent, robust, and transparent evaluation and performance measurement of programs and policies.[21] The Evaluation is a Tier One Evaluation, as described in the Department's Evaluation Strategy, due the IGCI's funding levels, risk levels and public profile.[22] As such, the Evaluation has been governed by a Reference Group and was required to meet certain criteria, which included extensive consultation, high resource allocation, and the involvement of central agencies.

1.2.3 Prior reviews of the IGCI

Prior reviews of the IGCI have included a Post-Commencement Evaluation (conducted internally by the Department in 2016) and a Performance Assessment (conducted by Nous Group in 2018).

The Department's 2016 Post-Commencement Evaluation focused on IGCI design and implementation (from late 2014 to end May 2016) to identify and address early issues that could affect the IGCI's long-term viability and impact.[23] The Post-Commencement Evaluation found that:

- The IGCI was flexible and adaptable in its implementation, allowing the GCs to define the needs of their sector and set their own vision and activities.
- The industry-led approach created challenges and delayed the establishment of the GCs. The Department reassessed the scope and nature of its role in supporting the GCs and provided more assistance, despite low capacity and expertise at the time.
- The time between the announcement of the IGCI and the establishment of the GCs was too long. Poor communication regarding timing resulted in confusion and reduced stakeholder engagement.
- The role of the GCs in relation to other funding programs required time to understand and develop.
- Growth Centre Advisory Committee (GCAC) membership was positively regarded, and the contribution of the four independent members, all industry leaders, highly valued. However, its role was unclear.
- The IGCI did not have adequate evaluation documentation. The key performance measures focused on outputs rather than outcomes, resulting in future evaluations not being able to adequately demonstrate achievement against the objectives (further discussed in Section 4.3).
- The IGCI did not consider all the lessons from the related Industry Innovation Precincts program.

The 2018 Nous Group Performance Assessment focused on the GC's value-add, impact on each sector, and their ability to meet funding agreement requirements, address sector challenges, and collect appropriate data. The Performance Assessment found:[24]

- The GCs vary in their growth status, size, maturity, and composition, which affected their impact.
- The GCs are generally on track to meet the objectives, enhance focus and alignment across industry and innovation policy initiatives and stakeholder feedback was positive.
- Longer-term evaluations are needed to assess sector-wide impact.
- More consistent and appropriate approaches are needed to measure GC and initiative-wide impact.
- Data collection and performance measurement need greater consistency and alignment.

[21] Office of the Chief Economist (2017). *Evaluation Strategy 2017–2021*. Canberra: Australian Government Department of Industry, Innovation and Science.

[22] Ibid.

[23] Office of the Chief Economist (2016). Op. cit.

[24] Nous Group (2019). *Performance Assessment of the Industry Growth Centres Prepared for the Department of Industry, Innovation and Science (Unpublished)*. Sydney: Nous Group.

1.3 Scope

This Evaluation has focused on medium-term outcomes. The aims of the Evaluation were to:

a) better understand how each GC prioritises and responds to growth opportunities and threats
b) determine whether the IGCI is achieving impact.[25]

The Evaluation considered the GCs' individual objectives and work plans, the presence of various different inputs and outputs and the performance of individual GCs and the IGCI as a whole.

The scope of the Evaluation was as follows:

— *Appropriateness* of the IGCI's design, including the rationale and alignment with strategic objectives, comparability of the IGCI's design and policy context and objectives with its' outcomes, as well as with industry transformation initiatives overseas
— *Efficiency* of the administration of the IGCI, monitoring and evaluation (performance measurement) and inter-agency cooperation
— *Effectiveness*, including performance, progress towards outcomes, and obstacles encountered.

1.3.1 Timing of the Evaluation

This Evaluation was conducted during a challenging year for Australian businesses and for the GCs. The 2019-20 Black Summer bushfires caused widespread damage: destroying 186,000 square kilometres of land and over 5,900 buildings,[26] reducing tourism sector revenues by more than A$1 billion[27] and causing more than A$103 billion[28] in property damage and economic losses. This was followed by floods in some parts of Australia. The COVID-19 pandemic exacerbated these challenges, causing widespread disruption of travel and supply chains, with significant economic impacts for Australian businesses and individuals.

The Evaluation methodology was modified to manage these challenges and the resulting impacts on the GCs and other stakeholders. The modifications included:

— replacing face-to-face stakeholder consultation and meetings with the Department with telephone and video conferencing
— delaying the survey of and consultation with GC participants and non-participants, and with AustCyber and FIAL GCs (CEOs, senior staff, directors) until July 2020
— undertaking additional engagement with the GCs during the drafting of the survey of GC participants to reduce the response efforts required, while aiming to increase uptake by GC stakeholders and improve the detail and robustness of the Evaluation
— extending the Evaluation to contextualise this report in light of the announcement of the MMS in the 2021-22 Federal Budget.

Stakeholder consultation was conducted from June to September 2020, with the surveys active between mid-July and mid-August 2020. As such, stakeholder views were obtained prior to the delivery of the 2020-21 Australian Government Budget on 6 October 2020, and do not reflect the announcements in the context of that Budget, including the MMS.

[25] We note that administration was addressed as part of previous evaluations. As such, and on advice from the Department, previous evaluations will be the primary evidence base for identifying issues relating to the IGCI's administration.

[26] UN Environment Programme (2020). *Ten impacts of the Australian bushfires*. Accessed 2 November 2020: https://www.unenvironment.org/news-and-stories/story/ten-impacts-australian-bushfires.

[27] Kelly, L. (2020). *Australian tourism industry seeks urgent help as cost of bushfires grows*. Accessed 2 November 2020: https://www.reuters.com/article/us-australia-bushfires-idUSKBN1ZF027.

[28] Read, P. & Denniss, R. (2020). *With costs approaching $100 billion, the fires are Australia's costliest natural disaster*. Accessed 2 November 2020: https://theconversation.com/with-costs-approaching-100-billion-the-fires-are-australias-costliest-natural-disaster-129433#:~:text=With%20costs%20approaching%20%24100%20billion%2C%20the%20fires%20are%20Australia's%20costliest%20natural%20disaster,-January%2016%2C%202020.

1.4 Approach

The Evaluation leverages the detailed methodology developed by Dr Janssen. The approach draws from two complementary analytical strategies: contribution and attribution analysis. This two-pronged approach supports analysis of the extent to which the IGCI policy actions and investments around the IGCI are likely to create an innovation-evoking system, and whether the performance changes can be causally linked to IGCI policies.

The Evaluation was conducted over four stages:

— Stage 1: Project planning: development and refinement of a detailed Project Plan in consultation with the Department and Dr Janssen, project inception meetings between ACIL Allen, the Department and Dr Janssen, and a data-focused meeting.

— Stage 2: Information collection and review: desktop review, program data research, stakeholder consultation (surveys and interviews) and international comparison.

— Stage 3: Assessment and analysis: analysis using the Assessment and Evaluation Frameworks.

— Stage 4: Reporting: Draft Final Report and Final Report.

1.4.1 Operationalising Dr Janssen's methodology

Following the meeting with Dr Janssen, ACIL Allen operationalised the methodology in close collaboration with the Department and support from Dr Janssen. The Assessment Framework was streamlined. Data collection approaches and analysis methodologies were refined to:

— improve alignment with the Evaluation Questions presented in the Terms of Reference

— ensure that appropriate data is collected and assessed to address the Evaluation Questions

— account for data gaps and ensure the Evaluation is supported by robust and adequate evidence.

Dr Janssen's methodology includes:

— *Logical Framework Analysis (LFA)*, which assesses the consistency between how the IGCI was intended to operate and how the GCs have defined their priorities and activities.

— *Coordination Structure Assessment (CSA),* which examines the coordination structures (GC practices, structures, procedures, and protocols) for gathering and structuring information to inform GC's work.[29]

— *Technological Innovation System (TIS)* element, which investigates IGCI functions, including the extent to which the GCs have been building a TIS, whether the measures taken by the individual GCs were needed, their impact on the sector and the efficiency of this impact.

— *Impact assessment* (i.e. knowledge production and economic structure changes), which seeks to apply attribution-based analyses to relevant GC functions to identify sectoral impacts for each GC.

— *Performance Analysis*, which is designed to measure the IGCI's impacts at the firm and macroeconomic levels, including assessment of performance indicators, macro / industry level changes, analysis of firm-level impacts.

A detailed explanation of the Assessment Framework is provided at Appendix B. Alignment of the Assessment Framework with the Department's key Evaluation Questions is also provided at Appendix B.

[29] Janssen, M. (2019). *Methodology for an Initial Impact Evaluation of the Industry Growth Centre Initiative (IGCI) (Unpublished)*, page15.

1.4.2 Data sources used to inform the Evaluation

The Evaluation was informed by:

- *Desktop review:* focused on Department documents and publicly available information to inform the understanding of the IGCI and associated policy strategies, GC ambitions and activities, and relevant evaluation methods and policy analyses. This informed the LFA, CSA and Impact TIS.
- *Program data research:* focused on policy documents and program data, obtained from the GCs and Department, including reports, annual Business Plans and Sector Competitiveness Plans (SCPs), and financial data. This informed the assessment of the GC's activities, participation profiles and patterns, and outputs.
- *International comparisons:* focused on similar international policy strategies to understand how policy choices relate to outcomes. The three comparators were: Catapult Networks (United Kingdom) and Topsectors (the Netherlands), and Strategic Innovation Programs (SIPs, Sweden). This focused on the LFA, CSA, actions and evaluation findings to date.
- *Stakeholder consultation:* including members of the Department, the GCAC, GC representatives and stakeholders, officials from relevant federal, state and territory government agencies, peak bodies, and industry associations, and firms not involved in the GCs (non-participants). The non-participants were identified as businesses which had participated in the Entrepreneurs' Programme (EP) but not in the GCs (according to the GC Customer Relationship Management databases). Stakeholder consultation was conducted prior to the delivery of the 2021-22 Federal Budget and does not reflect the announcement of the MMS.
- *Stakeholder surveys:* including a survey of GC participants and non-participants. The GCs identified and distributed the survey to their participants. ACIL Allen and the EP Program Area distributed the survey to non-participants. The stakeholder surveys were conducted prior to the delivery of the 2021-22 Federal Budget, and do not reflect the announcement of the MMS.
- *A Departmental study drawing on Business Longitudinal Analysis Data Environment (BLADE)* has provided a quantitative assessment component. This has been published separately to this report.[30]

A detailed description of the data underpinning the Report is provided at Appendix B.

[30] Office of the Chief Economist (2020). Op. cit.

Industry Growth Centre Initiative 2

This Chapter grounds the Report, discussing the IGCI's purpose, objectives, and rationale. It considers the IGCI against relevant elements of the LFA and CSA and compares the design of the IGCI with international models.

2.1 IGCI policy rationale

Australian industries face a number of common challenges including; decline in export prices, reduced public finance following the Global Financial Crisis and most recently the COVID-19 Pandemic, the rise of disruptive technologies, increased production costs, low job growth rates outside the public sector and an ageing population.[31] Australian industries are diverse, complex and geographically dispersed. They are dominated by small to medium enterprises (SMEs) and challenged by the absence of economies of scale.

Internationally, the increasing strength of Asian economies affects global demand for goods and services. As these nations become major suppliers of goods and services, the competitive pressures on Australian businesses are increasing. For Australia's industries to be competitive, business and government have embarked on a journey of structural reform. This is required, particularly in the sectors of greatest economic potential, to foster innovation and drive competitiveness and growth.[32]

The original IGCI documentation indicates that government intervention through the IGCI was required to convert sectors of comparative advantage to ones of competitive advantage and to address persistent market and system failures (discussed below).[33]

Both of these arguments have played a role in the establishment of the IGCI. The comparative and competitive advantage argument requires government as a partner in creating and shaping markets, while the market and system failure argument calls for government intervention, particularly through the provision of funding. Both arguments are used to justify similar initiatives in other countries.

In the 2020-21 Federal Budget,[34,35,36] the Australian Government identified manufacturing as a key focus in supporting Australia to recover from COVID-19 and build resilience and competitiveness for the future. This provided for funding extensions to four GCs (AMGC, FIAL, METS Ignited and MTPConnect) to support the implementation of the MMS in the immediate term and contribute to outcomes aligned with the National Manufacturing Priorities (see Box 1.1). This recognises the value the IGCI can continue to offer in supporting Australian industry.

[31] Commonwealth of Australia (2014). Op. cit.

[32] Ibid.

[33] Department of Industry, Science, Energy and Resources (n.d.). *IGC Policy Overview Final, internal document (Unpublished)*. Canberra: Australian Government.

[34] Australian Government (2020). Op. cit.

[35] Morrison, S. (2020). Op. cit.

[36] The Treasury (2020). Op. cit.

2.1.1 Comparative and competitive advantage arguments for policy intervention

Several industry sectors, including those of the first five GCs, were identified in numerous analyses by Deloitte Access Economics, PricewaterhouseCoopers, IBISWorld, Outlook Economics and McKinsey & Company, as having strong growth potential, comparative advantage and potential competitive strengths.[37,38] The plan was to develop industry polices that capitalise on Australia's strengths and the growth prospects, particularly among high-potential SMEs and in the most promising sectors. This is in line with thought leaders in the field, who argue that a pro-active public policy is required for innovation-led growth.[39] This shifts the role of government from market-failure solutions, to becoming an active partner in creating and shaping markets.

2.1.2 Addressing market and system failure as a rationale for policy intervention

The market failure argument is consistent with economic theory which suggests that the role of government should be to intervene where market failure exists, and the benefits of addressing the failure outweigh the costs of intervention. Many argue that this concept of *market failure* should be expanded in the innovation policy context to *system failure*, to more accurately reflect the complex and dynamic system-wide nature of the issues facing Australian industries.[40]

The challenges with system failures are in the failure of various parties, such as industry and research organisations, to drive change. This places the responsibility on government to adopt broader policies and shift from a top–down government-led to a bottom-up industry led approach.

Australia began shifting to broader policy responses to address system failures in the early 2000's.[41] This required government to perform a broader facilitation and coordination role to improve the business operating environment, and has focused on:[42]

— the economic settings and incentives to enable strong businesses to grow and markets to function
— improving the structure and operation of sectors
— facilitating opportunities for non-market interactions to encourage more effective innovation pathways
— addressing framework conditions such as lowering the cost of doing business through less regulation, lower taxes, and more competitive markets
— skills development.[43]

The IGCI emphasises this policy shift with a focus on system connectivity and demand-led responses.

A range of policy initiatives can be used to address innovation market and system failures. These include subsidising cooperative research and development (R&D), balancing competition and government procurement policies to generate diversity and ease the entry of new firms to market, facilitating access to venture capital to bridge the 'valley of death' for research commercialisation,[44] supporting research commercialisation through bridging arrangements (such as public-private partnerships), and supporting the high cost of applying innovation in input-supplying industries. The potential value provided by each policy instruments varies across sectors, depending on the dominant sources of market failure. The IGCI aims to

[37] Department of Industry, Innovation and Science (2019). *Industry Growth Centres Initiative: Progress and Impact*. Canberra: Australian Government.

[38] Commonwealth of Australia (2014). Op. cit.

[39] Mazzucato, M. (2015). *A mission-oriented approach to building the entrepreneurial state. Project Report*. UK: Innovate UK.

[40] Dodgson, M., Hughes, A., Foster, J., & Metcalfe, S. (2011). Systems thinking, market failure, and the development of innovation policy: The case of Australia. *Research Policy, 40*(9), 1145-1156.

[41] Ibid.

[42] Bleda, M., & Del Rio, P. (2013). The market failure and the systemic failure rationales in technological innovation systems. *Research Policy*, 42(5), 1039-1052.

[43] Dalitz, R., & Toner, P. (2016). Systems failure, market failure, or something else? The case of skills development in Australian innovation policy. *Innovation and Development*, *6*(1), 51-66.

[44] Ford, G. S., Koutsky, T., & Spiwak, L. J. (2007). A valley of death in the innovation sequence: an economic investigation. *Available at SSRN 1093006*.

address Australia's innovation challenges by providing three main policy initiatives: support for commercialisation; bridging institutions; and R&D support.

2.2 IGCI design

The IGCI design reflects national and international initiatives, including the Catapults, the Topsectors, SIPs (see Appendix D), the United States' Small Business Administration's Regional Cluster Initiative, and the Canadian Business-led Networks of Centres of Excellence.[45] Design elements from the Business Council of Australia's *Building Australia's Comparative Advantages* report were also incorporated.[46,47]

The IGCI and three international comparators are all industry-led, government-supported initiatives. The design consists of an overarching framework, supported by government, and several industry-led independent, private, not-for-profit companies (i.e. GCs). These companies are expected to be agile, responsive, and flexible, driven by a commercial mind-set. They all aim to address market and system failures. They are all seen as long-term strategic approaches to innovation policy, which are recognised as essential for addressing underlying challenges/failures in the Australian economy. The need for a long-term strategic approach is reinforced by the recent extension of IGCI funding through the MMS.

2.2.1 Objectives and intended outcomes

The IGCI's overarching objective is to:[48]

> *…improve the productivity and competitiveness of sectors of competitive strength and strategic priority in the Australian economy. It will take a national sector approach to structural reform and address barriers to productivity, competitiveness and innovative capacity at the sector level where economic growth can be maximised.*

Box 2.1 IGCI objectives and outcomes

IGCI objectives

1. Improving engagement between research and industry, and intra-industry engagement to improve collaboration and commercialisation outcomes
2. Improve GC's capability to engage with international markets and access global supply chains
3. Identify unnecessary regulations for GCs that hinder growth and address reform
4. Improve management and workforce skills in GCs.

IGCI intended outcomes

a) A reduction in the cost of doing business through regulatory reform
b) Increased Research & Development (R&D) coordination and collaboration leading to improved commercialisation outcomes
c) More businesses, including small and medium enterprises, integrated into domestic and global supply chains and markets leading to increased export income
d) Improved management and workforce skills of businesses
e) Improved employment opportunities and contribution to the creation of high-skilled jobs.

Source: Department of Industry, Science, Energy and Resources (2020). Industry Growth Centres. Accessed 26 May 2020: https://www.industry.gov.au/strategies-for-the-future/industry-growth-centres.

The IGCI's funding extension and alignment of the IGCI with the newly announced MMS provides for the GCs to support the implementation of the MMS in the immediate term and contribute to outcomes aligned with the National Manufacturing Priorities (see Box 1.1). The GCs will be asked to realign and refocus their activities to support delivery of the MMS.

[45] Commonwealth of Australia (2014). Op. cit.

[46] Office of the Chief Economist (2016). Op. cit.

[47] Business Council of Australia (2014). *Building Australia's Comparative Advantages*. Melbourne: Business Council of Australia.

[48] Department of Industry, Innovation and Science (2016). *Industry Growth Centres Initiative Program Guidelines (unpublished)*. Canberra: Australian Government.

2.2.2 IGCI's governance arrangements

The IGCI is overseen by the Department and advised by the GCAC. The Department's role is set out in the 2018 IGCI Program Guidelines. This includes assessing GC proposals, advising the Minister, administering the IGCI, and supporting Australian Government engagement on regulatory reform. The original Program Guidelines were updated to include the role of the Program Delegate in ensuring efficient and effective administration.

The GCAC comprises four independent members and the GC Chairs. The GCAC advises on driving cultural change and overcoming barriers to innovation, productivity, and growth.[49] The GCAC provides support over the lifetime of the GCs, specifically, advising the Minister on:[50]

— the merit of each GC proposal, strategic policy, operation and performance of the GCs and the IGCI
— the Industry Growth Project Fund
— areas of competitive advantage, emerging industries, and potential new GCs
— matters relevant to the IGCI and broader Portfolio as it considers appropriate, including deregulation.

The IGCI's governance framework appears to broadly align with that of international comparators. The approaches all require oversight by both industry and government, including accountability for performance and strategy. The ultimate accountability rests with government for the Catapults and SIPs while, for the Topsectors, the role of the government has shifted over time from being an "inspector" to a partner.

The next chapter considers how these arrangements are working in practice.

As part of the MMS, the renamed and reinvigorated IISA has been established to inform and guide policy on industry, science and research and advocate and champion Australia's innovation, science and research system. This presents an opportunity to improve the IGCI's governance arrangements.

2.2.3 Funding and timing

Funding for the IGCI was announced in 2014, with staged establishment of the GCs from June 2015 (FIAL) to December 2016 (AustCyber). GC funding was provided for four years from establishment. Initial funding for the IGCI was $188.5 million, consisting of:[51]

— up to $3.5 million per year, per GC
— $60 million for commercialisation, including grants of up to $1 million, to be matched by industry
— $63 million for large scale collaborative projects focused on sector capability and competitiveness.

In 2018, the IGCI's funding was extended for two additional years with an allocation of $60 million,[52] bringing the total funding to $255 million (see Section 2.2.3).[53] The GCs were initially expected to become self-sustaining after four years of Government support.[54]

[49] Department of Industry, Science, Energy and Resources (2019). *Growth Centres Advisory Committee*. Accessed 3 June 2020: https://www.industry.gov.au/strategies-for-the-future/growth-centres/growth-centres-advisory-committee.

[50] Department of Industry, Innovation and Science (2017). *Growth Centres Advisory Committee Terms of Reference (unpublished)*. Canberra: Australian Government.

[51] Australian Government (2014). *Growth Centres to boost competitiveness...* op. cit.

[52] Australian Government (2018). *Industry Growth Centres Showcase, speech at the 2018 Industry Growth Centres Showcase by the Hon Karen Andrews MP*. Accessed 7 June 2020: https://www.minister.industry.gov.au/ministers/karenandrews/speeches/industry-growth-centres-showcase

[53] Actual expenditure and committed funding. Department data: Growth Centre Snapshot 11 June 2020.

[54] Australian Government (2014). *Growth Centres to boost competitiveness...* Ibid.

Following the 2020-21 Federal Budget's announcement of the MMS,[55,56,57] an extension was made to the GC's operational funding for the year 2021-22. As outlined in Section 1.2.1, this will include an additional $30 million to support AMGC over two years from 2020-21 and $20 million to support FIAL, METS Ignited and MTPConnect operating and administration costs for 2021-22.
The funding contracts for AMGC, FIAL, METS Ignited and MTPConnect were due to expire between the period June-November 2021. No operational funding was announced for NERA or AustCyber as their current funding agreements extend to or past June 2022. The funding extensions align the funding agreements of all GCs to at least June 2022.

Funding arrangements of the IGCI's international comparators vary but all seek to mix private and public funding sources. The UK Catapults and the Netherlands Topsectors have access to further conditional or competitive government funding streams, while Sweden's SIPs rely on the funds from VINNOVA.

The SIPs have a narrower focus than Australia's GCs and receive less funding than Australia's GCs. The Catapults, which are more comparable to Australia's GCs, receive significantly greater core funding.[58] In addition, the Catapults can bid for additional support from a range of competitive funding programs. The Topsectors, which can also bid for support from competitive funding programs, also receive more government support than Australia's GCs.

The current funding model for the Catapults is based on an expectation that they will earn about a third of their income from contract research for industry. A review by E&Y found that most were not achieving this target. The Catapults have been reviewed three times and as a result, on the last two occasions, the UK Government has increased their funding significantly (see Appendix D). The UK Government sees the Catapult program as one of its flagship measures to support industry growth. The funding levels provided to the Catapults have enabled them to reach a greater proportion of relevant businesses in their sector than the Australian GCs.

None of the IGCI's comparators are expected to become self-sufficient.[59] Continued government funding, at least in part, is seen as essential for maintaining effective operations. This has an important role in ensuring the initiatives are independent and trusted.

2.2.4 IGCI Program Logic

Standard practice calls for a Program Logic to guide the appropriate, effective and efficient implementation of a government program. However, the IGCI Program Logic and Evaluation Strategy were not developed until mid-2016, more than a year after the first GC was established. The Department's Post-Commencement Evaluation found that the lack of evaluation documentation made it difficult to plan and collect data for a thorough evaluation of outcomes and impacts.

The IGCI Program Logic outlines the need and key assumptions for the IGCI, the objectives, inputs, participants, Departmental activities, GC activities and short-, medium- and long-term outcomes. External factors that may influence the program are also included. The Program Logic is provided at Appendix C.1. The individual GC Program Logics are discussed in Section 3.1.

2.2.5 Identifying priorities

The Australian Government identified the broad and long-term overarching objectives of the IGCI, while the GCs have created sector-specific and adaptable visions and work plans to achieve the four objectives (i.e. through sector-specific Industry Knowledge Priorities and Sector Priorities). Following the announcement of the MMS, the GCs will be asked to support the implementation of the MMS in the immediate term and contribute to outcomes aligned with the National Manufacturing Priorities (see Box 1.1).

[55] Australian Government (2020). Op. cit.

[56] Morrison, S. (2020). Op. cit.

[57] The Treasury (2020). Op. cit.

[58] In 2018 the nine Catapults were allocated total funding of more than £1.1 billion ($A2 billion) for five years. This equates to around $A44 million per annum for each Catapult. Scaling this to take into account the difference in size of the two economies, an equivalent level of support for Australia's GCs would be approximately $A16 million each per annum.

[59] The Catapults were originally expected to become self-funding over time but this idea was abandoned after a review.

The IGCI's international comparators have taken a combined industry and government approach to identifying priorities. Government typically identifies the overarching sectors or areas of focus, and industry defines the sector or area-specific priorities. As evidenced by the evaluation of the Catapults, it is essential that program has a clear and consistent purpose and set of priorities across the initiative to engage stakeholders in long-term change.

2.2.6 Changes since 2016

A number of changes have occurred in the IGCI since 2016, most notably, the extension of the funding period from 4 to 6 years, the establishment of AustCyber, the development of the evaluation, performance monitoring and data collection approaches for each GC, following the 2018 Nous Group Performance Assessment and the announcement of the MMS.[60] There have also been a number of changes in Departmental and Ministerial responsibility for the IGCI since 2014.

As discussed above, AustCyber commenced operations in 2017. By this stage, the Department had reassessed the scope and nature of its role in the IGCI, and provided more assistance,[61] including increased resource allocation from two to four average staffing level (see Section 4.1). This increased capacity likely streamlined the establishment process, evidenced, in part by the faster publication of the AustCyber Sector Competitiveness Plan (SCP) in April 2017, four months after operations commenced, compared with the other GC SCPs which were all published at least 13 months after their establishment (see Section 4.2.1).

2.2.7 Self-sufficiency?

The GCs were required to become self-sustaining after four years.[62] This would have required the GCs to secure multiple and flexible sources of funding. There was initial scepticism from industry and peak bodies, such as the Business Council of Australia, on whether the GCs would be, or should be expected to become, self-sustaining after the initial four years:[63]

> *The UK's model of committing funding over a long period in proportion to industry investment and commercial revenues should be considered…It is unlikely that private markets by themselves will provide sufficient ongoing funds for the growth centre program, and this is not a requirement imposed on similar programs overseas.*

As part of the MMS funding extension, ACIL Allen understands that the Department will ask the GCs to submit a plan in 2021-22 outlining the approach the GC will take to transition to a sustainable private sector model.

2.3 Relevance of IGCI's original policy rationale

The issues that were identified in the development of the IGCI are, for the most part, long-term challenges. It is widely recognised that problems such as the lack of collaboration between researchers and industry will take many years of effort to rectify. The GC's SCPs establish ambitious ten-year visions for each sector. The GCs are only part-way into this planning horizon.

The IGCI has been highly flexible in allowing the GCs to establish their own vision and work plan in response to specific sectoral needs. The GC's work plans are guided by the priorities and evolving needs of their sectors, while remaining consistent with the Australian Government's strategic policy objectives and priorities. This is evidenced through the recent report: *Australia 2030: Prosperity through Innovation*.[64]

The IGCI will continue to align with Australian Government strategic policy objectives and priorities into the future, with alignment of the IGCI to the new MMS. This includes asking the GCs to realign and refocus their activities to support delivery of the MMS.

[60] Australian Government (2020). Op. cit.

[61] Office of the Chief Economist (2016). Op. cit.

[62] Department of Industry, Innovation and Science (2018). Op. cit.

[63] Office of the Chief Economist (2016). Op. cit.

[64] Innovation Science Australia (2017). *Australia 2030: Prosperity through Innovation*. Canberra: Australian Government.

Analysis of IGCI'S Objectives and Design 3

This Chapter examines the appropriateness of GC objectives and design, both in the context of the IGCI and the needs of the sector. This considered the LFA (Logical Framework Analysis) and CSA (Coordination Structure Assessment). See Appendix C for supporting information from the desktop review of the LFA and CSA. The initial findings from this analysis were updated with stakeholder consultation and survey information.

3.1 Key findings

The GCs have embraced the flexibility provided to pursue Government's policy objectives in industry-relevant way. They have established customised work packages, which attempt to meet changing sector needs. GCs invested considerable effort to ensure their design choices reflect national and international research, and stakeholder views and have engaged in ongoing revision, as needed.

The GC's design choices demonstrate that they have, in many ways, met the LFA and CSA at a satisfactory level (see Appendix C.2), although it is difficult to triangulate this assessment with quantitative information from the GCs. There is considerable variation in how GCs have conceptualised their role and prosecuted their responsibilities.[65] The GCs have executed their work plans in a way that is open, change-focused, leadership-oriented, adaptable and outcome inclusive (critical for the CSA).

It is not readily apparent whether these design choices (which have led to wide variety of GC-level activities being implemented) will deliver impacts to GC participants that outweigh the costs of the IGCI and also achieve reach across the broader sectors over time (see Chapter 5).

The design flexibility has affected the IGCI's evaluation readiness. Some GCs have progressed objectives somewhat different to those of the IGCI and changed these since commencing operations. Moreover, differences in GC objectives have driven differences in activities. It may not be possible or desirable compare the actions of one GC to another, even though they are funded through the same initiative.

In 2020 it is difficult to develop a clear line of sight between the IGCI, and the objectives pursued by some GCs through their activities. This line of sight will likely become less clear as the implications of these differences play out. The Department will need to consider these implications in planning for any future evaluations.

3.2 Purpose and objectives

The purpose and objectives of a policy should clearly articulate what government is trying to achieve and the direction in which policy actions should be undertaken to meet stated goals. Ideally, GC objectives should align with government policy to ensure public funding is being used as government intended. This Section considers the degree to which the purpose and objectives of GCs align with the IGCI, and the consequences of this alignment for the IGCI's evaluation readiness.

[65] The GCs have delivered a broad range of activities to address sector-specific issues, GC objectives and the needs of participants. The individual GC Program Logics do not accurately reflect these activities. Due to the delayed implementation of the Program Logics, the LFA analysis is less meaningful than intended by Dr Janssen.

3.2.1 Purpose and intended outcomes of the IGCI

In general, stakeholders perceive the Australian Government to be well-placed to intervene through a coordinated industry policy, and there is strong support for the industry-led approach. This is considered in line with international good practice. The six selected growth sectors are perceived to be appropriate areas for government investment and support.

Many stakeholders consulted perceive three of the four objectives (see Box 2.1) to be appropriate for supporting international competitiveness and boosting Australia's economy. The regulatory reform objective was seen to be less important to many stakeholders as it is generally seen to be outside the span of a GC's control. The other objectives were considered sufficiently broad to address the needs of each sector, yet flexible enough to address sector-specific needs.

However, the industry-led design has created challenges in distributing responsibility between industry and government. For example, the Department's Post-Commencement Evaluation and consultation for this Evaluation showed that there was a poor understanding of the Department's role during IGCI implementation. This delayed establishment of the GCs.[66] This sentiment was shared among the majority of stakeholders, who were confused about the role of government and industry in the industry-led design. The appointment of GC Chairs by Government contributes to the image of the GCs as a government program.

3.2.2 Purpose and intended outcomes of the GCs

The IGCI was established to address market, systems and policy failures in Australian sectors, and the capacity of industries to address them.[67] Consultation with the GC CEOs and Directors and a review of GC proposals and early documentation shows that extensive stakeholder consultation and desktop research was conducted by each GC to identify the sector-specific barriers to growth and progress.

Several issues were identified in common across sectors, including:

— poor intra- and inter-sectoral collaboration (all GCs)

— poor connections between research and industry (FIAL, MTPConnect, AustCyber and NERA)

— sub-optimal workforce skillsets and capacity (FIAL, METS Ignited, AustCyber)

— problematic regulatory issues (MTPConnect, NERA, AustCyber)

— suboptimal international connections and opportunities (FIAL, AustCyber, MTPConnect).

These issues and the key objectives of the IGCI were used to frame the IGCI's objectives and intended outcomes. An assessment of each GC's Program Logic identifies *broad* rather than strict alignment between the intended outcomes/impacts of the IGCI and the stated outcomes/impacts of GCs.

Stakeholder consultations revealed mixed findings on the appropriateness of GC objectives. There were some concerns among the GCs and industry stakeholders that the four objectives had been selected by government, rather than industry. However, some stakeholders observed that the objectives are broad in nature, and there is reasonable flexibility under each objective to design work programs to address specific needs within each sector (i.e. through sector-specific Knowledge and Sector Priorities).

While most stakeholders agreed that the first three objectives would be important in addressing significant issues in the sector, a number of stakeholders perceived regulatory reform to be beyond the scope and influence of the GCs. Some GCs and GC participants considered regulatory reform to be of limited concern to their sector, particularly in advanced manufacturing, and food and agriculture.

The combined industry and government approach to identifying IGCI and GC priorities is in line with international comparators. Across the four international comparators, government typically identifies the overarching sectors or areas of focus, and industry defines the sector or area-specific priorities.

[66] Office of the Chief Economist (2016). Op. cit.

[67] Australian Government (2014). *Growth Centres to boost competitiveness...* op. cit.

3.2.3 How well aligned are the GCs' objectives to the IGCI?

An important question is 'how well aligned are the GC and IGCI objectives'? (see Box 2.1). Government made a deliberate decision to embed flexibility in the IGCI's design, to enable the GC's to address the unique issues and characteristics of their respective sectors, which can change over time.

Analysis of each GC's objectives provided in Table C.1 shows that the GC objectives mostly mirror those of the IGCI. FIAL and MTPConnect have stated objectives which are effectively a one-to-one match with the IGCI objectives, despite the presence of some minor variations in wording. FIAL and MTPConnect are the only GCs not to have changed their objectives since inception.

METS Ignited's 2016 objectives are also a one-to-one match with the IGCI objectives, although its objectives were revised in 2020. These revisions sharpen the focus of METS Ignited's objectives to further align with those of the IGCI and reflect its maturation as a GC.

NERA's 2015 objectives align to the IGCI objectives, however there is some deviation with the splitting of IGCI Objective 1 into a dedicated 'collaboration' and a 'commercialisation' objective, and the amalgamation of Objectives 2 and 3 into a single 'supply chain and regulation' objective. NERA's objectives were recast in 2019 to reflect stakeholder feedback and sharpen its focus.

AustCyber's 2016 objectives are, by comparison, different. AustCyber splits an IGCI Objective 1 into two objectives, one aimed at driving 'collaboration and connectivity', and a second objective aimed at 'accelerating commercialisation' within an international context (thereby blending this objective with the second IGCI objective focused on international markets and supply chains). In 2016, AustCyber developed an overarching objective to 'demonstrate leadership coherence' for its sector. AustCyber is the only GC to have stated this type of leadership-focused objective (some stakeholders are not comfortable with this objective). In 2019, AustCyber reduced the number of its objectives from five to three. An 'export-focused' and 'education-focused' objective was identified, along with an objective focused on 'growing Australia's cybersecurity ecosystem'. These represent the most significant departure from the four IGCI objectives seen by any of the GCs.

AMGC's 2015 objectives are closely aligned with the IGCI objectives, with the exception of the regulatory burden objective which is not reflected in the GC's objective statements. AMGC's 2019 objectives however represent a significant change as they blend all aspects of all IGCI's objectives into four separate statements (see Table C.1).

Further, the objectives reported by GC's in key documents lack consistency. For example, one GC's objectives were different in its SCP, Annual Report and Business Plan. The objectives of other GCs vary among documents published within the same year, and between key documents and Program Logics. Feedback from some GCs indicates that this reflects the different purpose of these key documents, with the SCP being an external and industry-focused document that prioritises the sector and knowledge priorities over the objectives, while the Annual Report and Business Plan are operational documents which serve internal or probity purposes.

3.2.4 Why did some GCs choose fundamentally different objectives?

In general, stakeholders who demonstrated awareness perceived that the IGCI objectives broadly cover the issues in each sector, and to adapt over time to emerging needs. GC CEOs and Boards agreed there was sufficient flexibility to tailor their work plans and activities to address sectoral needs.

While most GC's use the IGCI's four objectives to frame their objectives, AMGC and AustCyber are notable exceptions. The main reasons cited by the GCs for these differences relate to the research commissioned during each GC's establishment, and feedback collected from stakeholders since inception. For example, AMGC commissioned a detailed analysis of its sector's needs and how to best position manufacturing as a globally competitive industry. This analysis identified that regulatory reform was not a significant priority for the sector. Issues relating to 'improving technical leadership' and 'increasing value-adding services to improve market differentiation' were more important to the sustainability and resilience of the sector.

AMGC, AustCyber, METS Ignited and NERA have all refined their objectives over time. The reasons for these four GCs changing their objectives are discussed in the GC assessments, in an attachment to the main report (*unpublished*). GC's cite feedback provided by stakeholders during the first three to four years of their operations, reflecting a need to sharpen their focus and pursue issues which drive competitiveness, as the main reasons for change.

The GCs have reflected this shift in emphasis through their Sector and Knowledge Priorities. These are an outward-facing demonstration of the GC's priorities and direction. This approach has de-emphasised the role of the IGCI objectives in framing GC objectives, and encouraged GCs to pursue objectives which reflect stakeholder needs or the industries knowledge priorities.

The justification provided by GCs for deviating from the IGCI objectives appears, on-balance, to be reasonable. Each GC has invested in significant research and consultation to ensure their objectives continue to align with evolving stakeholder and sectoral needs over time, and the knowledge priorities, which require prosecution. This is highly consistent with the IGCI's flexible design intent.

Implications for the IGCI's evaluation readiness

The flexibility afforded to the GCs in setting their objectives allows GCs to purse sector and stakeholder-specific issues. However, it makes it more difficult to evaluate the IGCI, as the GCs' objectives focus on all, some, or none of the IGCI's objectives.

Variation in GC objectives has given rise to different activities and investments. This makes is difficult to compare the activities or achievements of the GCs, or to aggregate their achievements to determine the IGCI's overall effectiveness.

Moreover, there are significant evaluation issues associated with two out of the six GCs (AMGC and AustCyber) making significant changes to their objectives over time. The fact that the pre- and post-2020 objectives for AMGC and AustCyber focus on fundamentally different aspects and are significantly different in design language, means that a long-term evaluation of these two GCs against a single set of objectives will be difficult. These GCs represent 34 per cent of IGCI funding, so a significant proportion of funding may not be able to be evaluated at the IGCI-level using the IGCI objectives. This may cause an accountability gap for the IGCI and the Department.

3.3 Design considerations

The IGCI's design elements are important in understanding the impacts of the IGCI. ACIL Allen's analysis of the IGCI design has been informed by advice from Dr Janssen.[68] The analysis draws on his Coordination Structure Assessment (CSA) framework's eight principles: 1. information retrieval; 2. openness; 3. leadership; 4. focus on change; 5. broad support – i.e. ensuring a diversity of organisations are engaged; 6. outcome inclusivity – i.e. determining whether a few or many benefit from the GC; 7. accountability; and 8. adaptiveness.

3.3.1 Information retrieval and openness

Information retrieval and openness are important in understanding how appropriate the GC's design decisions are. These principles can be used to address the question: did the IGCI have clear and consistent objectives? This assesses how the GCs identified and communicated objectives (opportunities and bottlenecks), ensured broad and representative involvement in identifying the objectives and ensured involvement of high-level stakeholders.

Information retrieval, openness and the IGCI

As noted previously, the IGCI was developed using a substantial body of evidence collected through consultation with national and international stakeholders/experts,[69] and experience from legacy programs (i.e. the Australian Government's Innovation Precincts programs).

[68] Janssen, M. (2019) Op. cit. See also Appendix B.

[69] Department of Industry, Innovation and Science (2019). Op. cit.

This evidence identified the need to establish dedicated industry coordination structures that drive the productive and competitive capabilities of sectors, which are key to Australia's future economic prosperity. Evidence from national and international stakeholders and independent economic analyses [70,71] was used to identify five and later six sectors which required government support. It appears that these sectors were chosen for their *comparative advantage*, which government aimed to convert to *competitive advantage*. The majority of the growth sectors were within the industry portfolio at the time.

Also critical to the IGCI's design was the need for the GCs to operationalise the objectives to exploit the opportunities and address the bottlenecks facing industries. The IGCI's 2016 Program Guidelines required the GCs to identify their key Knowledge Priorities as the principal way of operationalising their objectives. These Priorities were used by the GCs to communicate sector needs and develop Business Plans to address these needs.

The participation of high-level industry and government representatives with appropriate expertise and experience, is managed through the GCAC. The GCAC offers a sounding board for the Chairs of the GCs and was intended to address overarching governance issues identified in similar international models (see Appendix D).

Information retrieval, openness and the GCs

The GCs also use consistent processes to communicate their priorities. Most communications and engagement are underpinned by a stakeholder engagement strategy through digital tools, workshops, events, and membership engagements. Several GCs have dedicated mentoring and formal education programs to support their engagement and to prosecute priorities. There is some anecdotal evidence to suggest these training programs are being used by a small number of industry stakeholders, but it is unclear whether they are delivering tangible benefits to participants.

GCs claim to have used a range of engagement activities that include participation from a broad stakeholder base. However, levels of engagement have varied, and it is difficult to determine whether those involved have been truly representative of their sector. Openness is addressed in more detail in the GC assessments, in a separate report.

It is similarly difficult to determine whether the appropriate high-level industry, research or government representatives are involved in the work of GCs. At face value, all GCs have Boards with most directors from industry. Two GCs have formal Memoranda of Understanding with industry associations which are intended to ensure formal engagement. However, consultations suggest these arrangements are not working as well as they should. Other GCs use a combination of research project, engagement, event, and membership-driven activities to attract the participation of high-level industry stakeholders. It does not appear that GC agendas are overly dominated by traditional market participants or established research/science agencies, but rather reflect a broad range of interests of industry. However this point is impossible to assess from the data collected for the Evaluation.

3.3.2 Leadership

The leadership model adopted by GCs impacts the types of activities undertaken, interactions with key stakeholders and overall outcomes from activities/interactions. Leadership relates to efficiency and inter-agency cooperation as it raises the question as to whether the agencies involved with the IGCI and GCs work effectively together. It also asks whether there are adequate processes to ensure GC leadership can drive change. Additional analysis relating to inter-agency cooperation is provided at Section 4.4.

The CSA identifies the importance of leadership in delivering the IGCI. This would be evidenced by the GCs obtaining a position that would allow them to set the direction for their sectors, with involvement of high-level representatives from different stakeholder groups. Dr Janssen suggests that the GCs should be covering entire sectors rather than specific domains and that their legitimacy needs to be based on authority (experience, expertise, etc).

[70] Department of Industry, Innovation and Science (2016). Op. cit.

[71] Commonwealth of Australia (2014). Op. cit.

Most stakeholders outside the GCs and their participants do not accept that the GCs are in a position to play a leadership role across their sector. The GCs have very limited resources and are operating in sectors where there are well-established industry associations, research organisations and even some government agencies. For example, in the agriculture sector there are longstanding R&D and marketing corporations. In the medical and biotechnology sectors there are strong industry associations with large memberships.

Consultations with stakeholders from these groups show that they do not accept that the GCs have a credible leadership role. They are willing to collaborate with the GCs and in some cases have Memoranda of Understanding with GCs. However, most of these stakeholders are reporting limited collaboration with the GCs and, in some cases, see the GCs as seeking to operate in their "territory" without having the resources or membership backing to lead. The GCs need to engage more productively with industry associations, some research organisations and government agencies to achieve win-win outcomes for both parties.

That said, a number of stakeholders spoke very favourably about individual GCs and their ability to collaborate on particular issues. For example, some GCs have assisted state governments to undertake road mapping and strategy development exercises and industry-based consultation. This assistance was valued because it provided strong insight about industry need and brought new networks to the fore.

The role of the Department and GCAC

As discussed previously, the Australian Government's role was to provide a framework for industries to design and lead the activities required to address market, system and policy failures. The GCAC was established to provide overall leadership, guidance and advice.[72]

The Department has a range of responsibilities spanning the assessment of GC proposals, program and policy advice, management of grant/funding agreements, approval of GC work plans, assessment of GC quarterly and Annual Reports, and responsibility managing the underperformance of GCs.[73]

The consultations have identified that the GCAC has focused primarily on helping the GCs establish, ensuring ministerial support for the IGCI and supporting some GCs through CEO and Board-level changes. The GCAC, GC and Departmental stakeholders report that the GCAC has not focussed on GC performance, strategy or direction, or alignment of the GC and IGCI objectives/outcomes. While the GCAC is a high-calibre body, it is only advisory. The GCAC has a limited remit to focus on and influence the efforts and priorities of the GCs. GCs and the GCAC noted the value of involving a high-level Departmental representative as a symbol of support for the Program and a practical way to improve the usefulness of the meetings, the integration of the GCs with broader Departmental policies and programs and better guide the strategic direction, outcomes and impacts of the GCs.

The Department has focused on GC's compliance with their funding agreements (a requirement of good public administration). However, the Department has not been able to fully progress strategic matters or those related to evaluation readiness, despite considerable effort. In particular, most GCs have not collected adequate data according to their Performance Framework and KPIs (discussed further in Section 4.3).

Leadership and the GCs

Each GC is a not-for-profit company, governed by a Chair and Board of five initial high-profile sector members.[74] The Minister is responsible for selecting GC Chairs. The Boards have expertise from industry, research and the government and are supported by executive teams with relevant experience in industry and government policy.

The leadership models used by these executive teams and Boards are diverse. At least two GCs refer to their models as an 'ecosystems' model of leadership, however it is unclear what this means in practice. The approach of other GCs is more opaque and buried in the choices underpinning their day-to-day activities and investments. The range of leadership

[72] Department of Industry, Science and Innovation (2016). Op. cit.

[73] Ibid.

[74] Ibid.

approaches spans network facilitation, cluster participation, the use of formal agreements, and participation in educational leadership.

3.3.3 Focus on change and adaptiveness

The CSA suggests that GCs should support industries to 'focus on change' and to be 'adaptive' so that they are first, competitive, second, resilient and third, sustainable. This requires consideration of the processes used to modify IGCI and GC strategies to drive change and growth within industries and whether these processes are aimed at achieving firm-, sector- or system-level changes.

Focus on change and adaptiveness: IGCI-level perspective

Change and adaptation are key IGCI concepts and are built into the IGCI's overarching objectives. Funding agreements with the Australian Government afford considerable flexibility for GCs to set their own change-related objectives and to execute their objectives to best meet sector needs. GCs must publish a SCP and to comply with the Program Guidelines. These plans are updated regularly to respond to sector changes. The GC annual Business Plans are further evidence of their ability to strategically respond to changing sectoral needs.

Focus on change and adaptiveness: GC-level perspectives

All GCs have processes in place to drive change at the firm and sector-wide levels. These processes pivot on the priorities and strategies that have emerged from SCPs and stated Knowledge Priorities. They are enhanced and renewed on a regular basis. Change-related processes are supported by active senior management and GC Boards.

All GCs have adopted processes which encourage adaptation at the firm and sector-wide levels. All GCs use projects as a central element of their approach to adaptation. These projects relate to the GC Knowledge Priorities and often involve small, medium, research and industry partners. Further, all GCs communicate the key project findings which often includes a strong rationale for change/adaption.

Some GCs provide firm-level education, either through accredited training, an 'academy' (where participants receive training) or a mentoring program (where businesses are coached).

All GCs manage programs of events (of various size, location and topic). These are critical for communicating information about sector change and are underpinned by communications and social media capabilities that help deliver information (when needed) to GC participants.

Consultations with GC participants identify that GCs are on-the-whole very focused on change. For participants who received research grants, the outcomes have been positive. These businesses have experienced improvements in a range of operational, service/product and client-related conditions. Most participants who held grants cite the interactions with a GC as critical in improving their business conditions and performance. Participants in other GC activities, by contrast, struggle to identify how the interactions have helped their business.

Focusing GC change-related activities

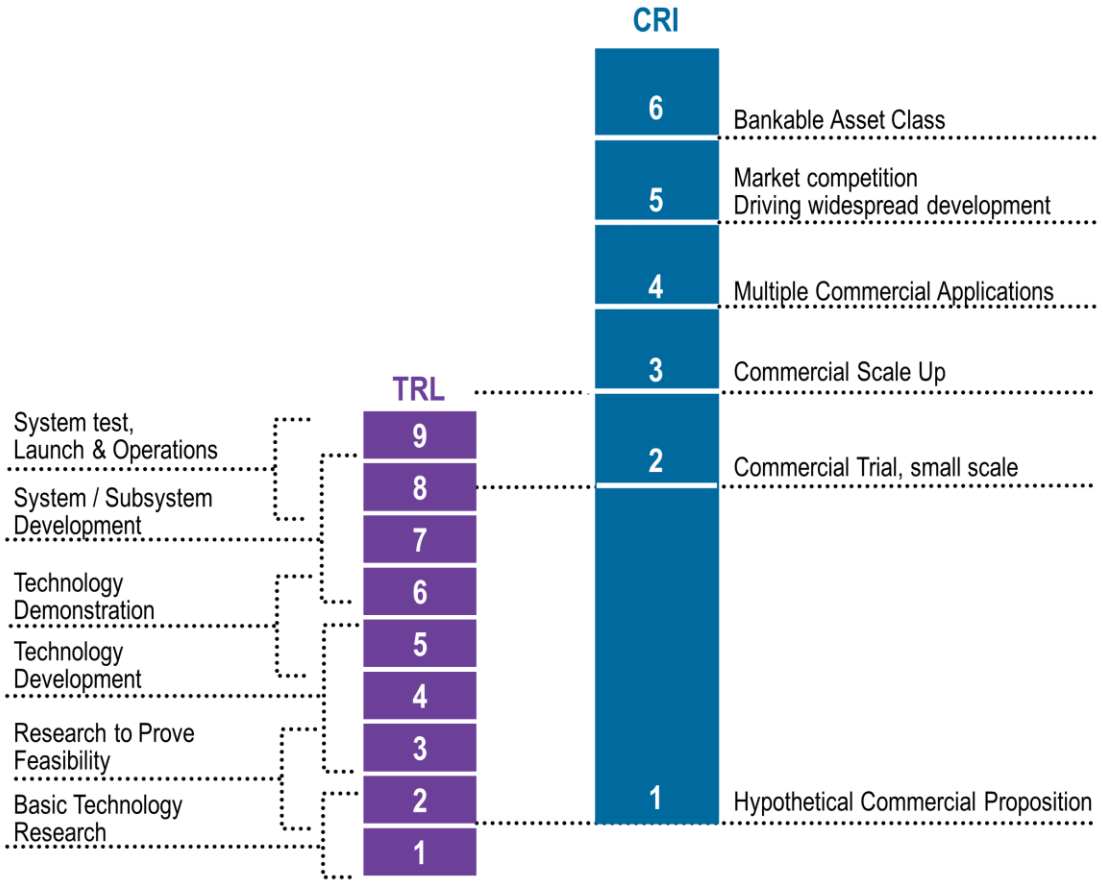
While the breadth of GC change-related activities is valued by some stakeholders, it also raises questions about focus and boundary issues related to the Department's portfolio of innovation and commercialisation programs/initiatives. For a selection of senior stakeholders consulted for the Evaluation, there is a need to focus GC activities and investments on areas which best leverage their unique position within the portfolio. This focus is important because GCs and the Department have limited resources and their offerings to industry should not duplicate or attempt to replicate support provided by other programs.

For these stakeholders there is a clear need for the GCs to focus on providing translation support where there is a gap in existing portfolio support measures. According to them, this gap lies at Technology Readiness Levels (TRL) 4-6 and Commercial Readiness Index (CRI) Level 1. The TRL index is a globally accepted benchmarking tool for tracking progress and supporting development of a specific technology through the early stages of the technology development chain, from blue

sky research (TRL1) to actual system demonstration (TRL9) over the full range of expected conditions.[75] The CRI begins once the technology is at the stage where there is research to prove that it is feasible in the field (TRL 2). The CRI extends to when the technology or application is being commercially deployed and has become a bankable asset class.[76] The relationship between the TRLs and CRIs is provided at Figure 3.1.

It also provides a stronger basis for helping non-GC participants to understand how their needs relate to a GC and the other portfolio of programs. Most non-participants consulted did not understand the boundaries between GCs and other programs, and cited the need for more clarity on this issue in the future. Stakeholders would value a clear map of which innovation and commercialisation programs/initiatives are relevant to them as they mature.

Figure 3.1 Relationship between TRLs and CRIs



Source: ARENA 2014

3.3.4 Broad support and outcome inclusivity

To realise the scale of change required, the IGCI needs to generate broad support for the GCs and the GCs need to deliver outcomes that are inclusive of the target group and of sufficient reach. The Evaluation has considered the processes GCs use to balance support for individual firms or groups and has assessed the processes used to ensure the GC's actions benefit non-participating firms.

All GCs have architecture in place to support a broad range of firms. Their processes capture a diverse range of activities, events, classes, programs, research opportunities and networking activities. This includes participants from research, government, and international communities.

[75] ARENA (2014). *Technology Readiness Levels for Renewable Energy Sectors*. Canberra: Australian Renewable Energy Agency.

[76] Ibid.

GCs mainly focus on supporting the needs of their participants. The GCs' broader impacts, discussed further in Chapter 6, appear to be restricted, for example, to broad initiatives and participation on government taskforces. It is unlikely that non-participants would be able to attribute any spillover impacts to the GCs, given their limited awareness of the IGCI. However, GC documentation identifies a diverse array of processes and activities which seek to benefit non-participants, especially through their work with industry associations and state governments (e.g. the NSW Advanced Manufacturing Strategy was developed through consultation and review of the AMGC strategies and SCP). Some GCs anecdotally report that their insights and learnings are communicated widely (i.e. through their website and social media analytics). However, it is difficult to assess how much impact this has on non-GC participants operating within each sector.

Outcome inclusivity also considers the efficiency and effectiveness of the relationships between the GCs and various agencies in supporting the needs of sectors. Inter-agency cooperation is discussed further in Section 4.4.

3.3.5 Governance and accountability

Governance

The IGCI's governance model involves multiple stakeholders: The Minister, Program Delegate; the GCAC; individual GC Boards, Founding Members of each GC (as required by ASIC); and the Department. The initial governance arrangements were deemed to be complex and were clarified following the Post-Commencement Evaluation to address early misunderstandings about stakeholders' roles and ensure that the expectations of all parties were aligned.

A number of Department and Ministerial changes have occurred since 2014. The GCs and GCAC (and many industry and government stakeholders) perceive that these changes significantly impacted the IGCI, disrupting GC productivity and requiring the preparation of briefings for new Ministerial staff. Stakeholders believe that, at times, the IGCI has lacked champions within the Government and Department. GCs noted this significantly delayed their establishment, as some suspended recruitment until late 2015, when uncertainties about funding were resolved.

More broadly, a wide group of stakeholders perceive a failure of the Department to engage deeply and at an appropriate level with the GCs, and to broadly champion the IGCI. Some stakeholders consider that the IGCI, as a program, lacks accountability and strategic guidance as the Department's role is seen to be limited to administration of a funding agreement. Stakeholders perceive that it has not provided strong guidance about GC strategy or performance. ACIL Allen notes that Departmental staff have been attending GCAC meetings.

This lack of accountability flows through to the role of the GCAC. The current model positions GCAC as an advisory body with limited scope to question GC performance or to guide strategy. GCAC is required to advise a senior committee within the Department on the overall performance of the IGCI (i.e. on driving cultural change and overcoming barriers to innovation, productivity, and growth). GCAC does not get deeply involved in issues relating to program integrity, administration and performance. Further, the data provided to the GCAC is not adequate for committee members to understand the performance of GCs individually or collectively, and allow the GCAC to provide advice which would enhance the overall performance of the Initiative.

The effectiveness of the IGCI's governance model has been questioned by some stakeholders consulted. These stakeholders suggest that current model is not delivering the oversight needed to hold GCs to account for their performance and/or provide strategic guidance to GCs.

These stakeholders question why the GCAC does not have the same status as other portfolio program committees, which support Government's industry innovation and commercialisation agendas. In particular, they questioned why the IGCI was not part of the broader remit of Innovation Science Australia (ISA), which includes RDTI, EP, CRCs and other significant programs. ISA monitors and oversees a number of innovation programs under several sub-committees, which include senior level representatives on each committee, and is responsible for providing overall coordination advice to

Government.[77] Some stakeholders considered that having the IGCI outside the umbrella of the ISA appeared to be an anomaly and was potentially hampering its ability to clearly set clear boundaries between GCs and other programs.

As part of the announcement of the MMS, the ISA will be renamed and reinvigorated as the IISA. This presents an opportunity to improve the IGCI's governance arrangements.

Accountability

The CSA Framework considers whether the GCs are suitably accountable for their use of IGCI funding and whether there are suitable processes in place to ensure GC activities/investments are transparent. These aspects are considered in more detail in Chapter 4.

The Department is in a position to use a staged process to manage GC underperformance (see Section 84, Program Guidelines). This includes consultation between the relevant GC and the Department, which may be followed by the Department reviewing GC operations and activities and making recommendations for improvement. Should performance not improve, funding for the GC may be modified, suspended or terminated. To date, the Department appears to have adopted a 'light touch'. While some progress payments have been delayed until the required documents were provided or GC funding allocated according to milestones, the Department does not appear to have systematically intervened when GC management problems occurred or in instances where GC objectives were varied away from those of the IGCI. ACIL Allen notes that the Department did require one GC to revise and re-submit its SCP, which had contained a significant shift in objectives from the previous year.

[77] Innovation and Science Australia (2020). *Innovation and Science Australia sub-committees*. Accessed 11 September: https://www.industry.gov.au/strategies-for-the-future/innovation-and-science-australia/innovation-and-science-australia-sub-committees.

Analysis of IGCI'S Delivery and Administration 4

This Chapter focuses on the IGCI's efficiency and GC administration, as well as the structures used to support monitoring and evaluation, and intra and inter-agency cooperation. It considered elements of the CSA framework by asking: *were the right structures in place to achieve the IGCI's objectives?*

4.1 Key findings

The IGCI's implementation took some time. There are several reasons for this, not all of which were within the GCs' control. However, the slow start has delayed the achievement of outcomes and impacts.

It is difficult to form a view on administrative costs. Some GCs support activities and/or use their staff to undertake activities which are not separately costed from the GC's general administrative costs.

GC quarterly reports trigger milestone payments but are not used to guide strategy or account for performance by the Department or GCAC. Financial accountability could probably be achieved by the submission of a quarterly/year-to-date financial statement accompanied by a suitably worded declaration signed by the GC Chair.

The leveraging of Project Funds by the GCs has generally been very good. Contributions from project participants have exceeded the target of 50 per cent of costs. However, managing project funding and timelines is challenging and the GCs need some latitude in this regard. The Department needs to liaise closely with GCs to ensure that funds are spent in a timely manner.

Performance measurement is challenging given the nature and flexibility of the GC objectives and the poor consistency between the GC's Performance Frameworks. The lack of standardisation of performance metrics has made it very difficult, if not impossible, to conduct any future quantitative evaluation of the IGCI. Urgent effort is needed to develop a small number of SMART KPIs focused on outcomes and impacts, that are based on common definitions and consistent methods. The Department is best placed to undertake sector-wide measurement based on ANZSIC codes agreed with the GCs. This will be very difficult for some GCs.

The primary value offered by the GCs is as a coordinator and relationship broker across the sector. Collaboration between GCs has generally been good, supported by some excellent examples. Collaboration with other programs is variable, opportunistic and depend on GC personnel. This stems from stakeholders' poor understanding of the unique value proposition of the IGCI and its role in the innovation ecosystem. There may be some cases of duplication, however, this can be addressed over time.

4.2 Administration

4.2.1 IGCI delivery timetables

There were significant delays in establishing four of the first five GCs.[78] FIAL, which transitioned from the Industry Innovation Precincts program was the fastest to mobilise. Because the GCs were autonomous, the machinery of establishment was left to GC Chairs with minimal Departmental involvement. These issues were exacerbated by a public service recruitment freeze and a lack of internal program implementation experience,[79] which meant that the Department lacked the resources to facilitate GC implementation efforts.

The Department addressed these delays by reassessing the scope and nature of its role, and providing more assistance, for instance, through "*…contracting business development managers to assist the Chairs with establishing the initial not-for-profit setup of the GCs and administration; …drafting templates for Business Plans to help Chairs meet government requirements and encourage consistency across the centres; (and) changing the approach for recruiting a CEO.*"[80] Additional Departmental staff and expertise were assigned, which improved the pace of establishment.

Government and industry stakeholders acknowledge that the delays were longer than expected. It was only in the latter half of 2016 (effectively two years after the funding announcement) that the GCs finalised and socialised their SCPs and rolled out their work programs. During this period there was a lack of communication with industry. It appears the Department underestimated the importance of engaging with industry.[81] Communications tools were developed and implemented to address this shortcoming (e.g. email updates, newsletters and industry-tailored communications).

4.2.2 Administrative constraints and costs

Each GC has implemented governance arrangements to support administrative integrity. These are based around the IGCI Program Guidelines[82] and other Guidelines issued by the Department. They include the Program Brand and Communication Guidelines, Annual Report, Quarterly Report, Final Report and Business Plan Guidelines, the Governance Guidance Template and SCP Guidance. The Program Guidelines set out the specific obligations, general operational requirements, and administrative requirements of the IGCI.

The GC Boards oversee the delivery of an annual program of activities which includes revising the SCPs, consistent with the program objectives, outcomes and reporting requirements outlined in the Funding Agreements and the Program Guidelines. Boards must ensure that GC funds are expended in accordance with these guidelines and the Funding Agreements.

The GCs must also be responsive to industry partners, given the requirements for co-funding of industry-led collaborative projects (which must be at least matched by project participants' cash). The need for clear and transparent accountability for IGCI expenditure is not at odds with industry expectations around management of its co-contributions, but it can add administrative complexity and the need for different reporting approaches. In effect, the GCs serve two masters.

The Funding Agreements between the Department and each GC form the key accountability mechanism, requiring reports/documents as follows:

— development of a SCP (with annual updates)
— preparation of an annual Business Plan
— quarterly financial report against financial milestones
— an Annual Report (including audited financial statements).

[78] Office of the Chief Economist (2016). Op. cit.

[79] Ibid. Page 4.

[80] Ibid.

[81] Ibid.

[82] Department of Industry, Innovation and Science (2018). Op. cit.

Given the payment milestones are directly linked to the provision of these reports, there is strong compliance even though not all GCs meet prescribed timeframes due to various reasons such as delays in finalising audited financial statements, leading to late submission of Annual Reports.

ACIL Allen notes that there are significant disparities between the scope and level of detail provided by GCs in their quarterly reports. Most are financial statements designed to meet the requirement under the Funding Agreements. Other GC's reports concentrate on activities and administrative/operational issues, with key milestones focused on inputs/outputs. There is limited attention given to outcomes or impact.

The Department uses quarterly financial reports as an important part of its governance and reporting requirements, including for tracking expenditure. However, several GCs consider that the quarterly reports add little value other than compliance with the Funding Agreement and triggering milestone payments. The reporting requirements are considered an unreasonable and disproportionate administrative burden. Poor understanding of whether the Department uses the reports for any purpose beyond financial accountability (e.g. to inform the policy formulation process) adds to their concern.

While the Department may need some type of report to make payments and comply with financial probity, in their present form, these reports contain financial data that is not useful and has little value in monitoring or re-directing GC progress.

GCs consider that reports could focus more on strategy and performance, however the frequency of reporting would need to be carefully considered so as not to add to the GC's reporting burden. If these documents included a more strategic focus, GCs could provide information on the risks and impediments that they have experienced during the reporting period that may have impacted on achievements of outputs or outcomes.

The GCs see value in the Department clarifying and where possible simplifying the level of detail required to meet its accountability requirements. Since moving the administration of all Australian Government grants to the Grants Hub portal (business.gov.au), new funding agreements have reporting templates attached, and budgets are input into the portal. This streamlines and standardises the reporting.

The funding extensions under the MMS provide an opportunity for the GCs and the Department to pursue regular and more meaningful reporting.

4.2.3 Financial management

The IGCI program delivers funding to the GCs through several tranches, as discussed below:

- *Operational expenditure:* are funds provided for staffing costs; overheads and projects and activities.
- *Project Funds:* are allocated to industry-led collaborative projects to improve the productivity, competitiveness, and innovative capacity within and between the six sectors. Projects must relate to the IGCI program objectives and require matched cash funding.
- *Industry Growth Network (IGN):* funding to establish a sector-specific IT infrastructure to build national networks. METS Ignited developed the IGN on behalf of AMGC, FIAL, MTPConnect, and NERA. AustCyber received funding to develop its own website.
- *Industry Leadership Providers:* funding for an industry leader per sector to liaise with the Department, GCs and industry to establish the GCs, identify strategic sector objectives and negotiate partnerships.
- *Regulation Reform activities:* funding to support the development and implementation of Regulation Reform Plans, including consultation with industry, state and territory governments and legal advice.
- *Sector Informed Grants:* funding for GC activities and projects to address sector-specific challenges.
- *Advertising and Marketing:* funding for a targeted national marketing campaign to increase involvement in the GCs and demonstrate their value to small businesses.

Table 4.1 details total Departmental funding (over six years) to each GC, totalled across the funding tranches outlined above. The breakdown by tranche for each GC is detailed at Appendix C. The Department's administrative costs are shown. The table does not include funding to be provided under the MMS.[83]

[83] Ibid.

Funding follows a consistent pattern across GCs – a relatively slow start building over years three and four and then tapering off. Given its later establishment, AustCyber lags the other GCs. All GCs receive similar levels of government support except for AMGC, which delivers the $4 million *Advanced manufacturing early stage research fund* for the Department.

Table 4.1 Allocation of IGCI funding, 2014-15 to 2021-22

GC	2014-15 (e)	2015-16 (e)	2016-17 (e)	2017-18 (e)	2018-19 (e)	2019-20 (e)	2020-21 (c)	2021-22 (c)	Total
AMGC	68,751	5,028,138	7,181,300	12,750,000	9,000,000	6,300,000	6,000,000	-	46,328,188
AustCyber	-	-	4,063,425	6,727,273	10,680,000	8,680,000	5,180,000	5,000,000	40,330,698
FIAL	3,000,000	4,235,600	7,149,432	12,295,455	6,754,090	5,000,000	5,000,000	-	43,434,577
METS Ignited	151,649	5,613,960	7,637,819	11,977,240	6,668,237	4,365,888	5,000,000	1,250,000	42,664,793
MTPConnect	76,400	4,666,094	7,141,900	11,780,000	6,500,000	4,625,000	5,000,000	1,250,000	41,039,393
NERA	45,222	4,288,284	7,140,175	11,750,000	6,500,000	3,958,000	5,000,000	2,500,000	41,181,681
Total	**3,342,021**	**23,832,076**	**40,314,051**	**67,279,967**	**46,102,328**	**32,928,888**	**31,180,000**	**10,000,000**	**254,979,331**
Departmental administrative costs		275,000	550,000	550,000	550,000	550,000	550,000		3,025,000

Note: (e): expended, (c): committed.

Note: Does not include $240,000 transitional funding for META (a former Industry Innovation Precinct program) paid from the program appropriation. This Precinct was not granted funding under the IGCI.

Source: ACIL Allen Consulting 2020, Department data: Growth Centre Snapshot 11 June 2020.

Only minor variances have occurred between total contract value and actual (including committed) expenditure. These differences have arisen when it has not been necessary to draw down the full value of grants (i.e. the work has been delivered under budget). The IGCI's under-expenditure is around 0.15 per cent of the total budget.

Payments have been made in accordance with each GC's Funding Agreement. The Department has processed payments based on receipt of the necessary reporting and acquittals documentation (e.g. quarterly reports, Annual Reports). While payments may be withheld/delayed for non-compliance such as the late submission of reports, no adjustments are made to account for actual GC cash flow, expenditure, and financial need (which tends to lag payments). The Department does not appear to assess the actual financial requirements of the GCs in processing payments nor consider re-profiling the overall program spend. The Department has advised that re-profiling overall program budgets is complex and only undertaken in special circumstances.[84]

In terms of transparency, only two GCs provide full audited statements on their websites, three provide summary information and one provides no financial information. This limits transparency for external stakeholders. At a minimum, provision of summary information would be appropriate.

Table 4.2 details the Project Fund committed by each GC[85] and their success in leveraging matched funding for collaborative projects from industry and other sources. The table does not include funding to be provided under the MMS.[86] Under the funding agreement, the GCs are required to secure at least matched funding for Project Funds. Some GCs have secured additional funds above the Project Fund matching requirements. The most successful was NERA, leveraging $26.4 million. Some projects have also leveraged in-kind contributions, and some have benefited from other third-party investment (in the case of MTPConnect this is estimated to be around $103 million. This data has not been systematically recorded

[84] This comment is based on feedback from a small number of stakeholders and is subject to further validation, especially with the Department.

[85] Each was allocated $15.6 million, excepting AustCyber, which was allocated $15.0 million. This totals to $93 million in Project Funds across the IGCI.

[86] Australian Government (2020). Op. cit.

across the GCs. Overall, the IGCI Project Funds have leveraged $132.6 million, which may increase as the GCs commit the remainder of their funds.

Table 4.2 GC funding and leverage

GC	Project Fund Contract ($m)	Project Fund Committed ($m)	Leveraged funding ($m)
AMGC	15.6	15.4	17.3
AustCyber	15.6	14.8	15.0
FIAL	15.6	15.6	17.8
METS Ignited	15.6	15.6#	22.0*
MTPConnect	15.6	15.6	35.8^
NERA	15.6	15.1	26.4
Total	**93.0**	**90.9**	**132.6**

Note: # This includes $2,027,427 earmarked but not yet allocated to the TAMM project.

* This excludes $2,027,427 million assumed to be committed for TAMM project.

^ MTPConnect has advised that as a result of these project funds being provided, the recipients were able to leverage an additional $103.5 million in third party external investment. This has not been included in the table.

Source: ACIL Allen Consulting 2020

Some GCs have negotiated with the Department to secure greater flexibility in the timing and nature of Project Fund allocation, for example, FIAL negotiated to use Project Funds to deliver clusters.

Total leveraged funding for each GC is discussed in Section 5.3. This shows that collectively, the GCs have leveraged $388.9 million. MTPConnect accounts for $236.3 million of this funding. This does not include the funds that have been raised by companies assisted by the GCs.

4.2.4 Administrative efficiency

As mentioned previously, the IGCI took almost two years for most GCs to become fully operational, impacting on the overall efficiency of the IGCI. Administrative funds of $275,000 (including two ASL at the APS level) were initially allocated to the Department to cover the cost of managing the IGCI Program. With the establishment of AustCyber, an additional $275,000 (and two ASL) per year were provided. A total expenditure of $550,000 per annum to administer a total program worth almost $250 million would appear to be inadequate for a program of this size. This excludes additional funding that was set aside to undertake evaluations, as per the Department's Evaluation Plan. At just over 1 per cent of total cost, this is well below normal government program administration cost benchmarks.

Some GCs have significant allocations directed towards operational and administrative expenses (up to 39 per cent of total budgets, which is very high by any financial test), while for others, these are expenses are small. This variation may reflect the fact that many GC activities are developed, driven, and executed internally – the staff are not just Project Fund managers. These costs could reflect actual activity costs (e.g. organising events or providing competency building services), rather than administrative costs. However, it is not possible to dissect administration and management costs to the level that they can be attributed to the activities undertaken. This makes the assessment of administrative efficiency difficult.

4.3 Monitoring and evaluation

The IGCI is underpinned by an Evaluation Strategy and Data Framework. These are consistent with the Department's broader evaluation and monitoring practices. They were developed in 2016-17, following the Post-commencement Evaluation, to allow for more rigorous data collection and performance measurement practices.[87] The Strategy involves evaluations shortly after commencement, after 2-3 years and again after 4-5 years.

[87] Department of Industry, Innovation and Science (n.d.). *A- Evaluation Strategy - Industry Growth Centres, internal document*. Canberra: Australian Government.

4.3.1 Measuring performance

Annual Business Plans and SCPs are intended to establish how the GCs will address the IGCI objectives and performance criteria. This includes the requirement for Annual Reports that report progress on activities, milestones and KPIs.[88] However, the Program Guidelines do not further direct GCs on how they should establish KPIs or assess outcomes.

The funding extensions under the MMS provide an opportunity for the GCs and the Department to pursue regular and more meaningful reporting.

Stakeholders widely acknowledge that measurement of the IGCI's performance is challenging. The UK Catapults have encountered similar problems.[89] This is made complex by the GC's flexibility, different GC performance metrics, the requirement for a long-term measurement approach, the requirement for GCs to generate large value from a small funding profile, and the challenges of attributing success when the GCs are designed to leverage a range of policy initiatives and deliver intangible impacts (i.e. facilitation and ecosystem development).[90]

Some stakeholders consider that performance measurement should be based on a core set of indicators and supplemented by BLADE analysis of the performance of GC-assisted businesses (see Chapter 7). One important stakeholder believes that case studies will be valuable for demonstrating success. A modest number of highly successful businesses could potentially pay for the cost of the IGCI.

However, attribution of such successes to the IGCI may be difficult to substantiate and the counterfactual impossible to establish. The Catapult report cited references to an unpublished Frontier Economics report which reviewed international experience and found that of eighteen studies of similar centres, only seven had tried to establish counterfactuals and only one had made a clear effort to justify its choice. Evaluations under the Catapult Framework are not expected to result in a single figure which robustly summarises the impact of a Catapult.[91]

4.3.2 Performance Frameworks

Although the need for individual GC Program Logics and performance measurement frameworks was identified in 2016, the development process did not commence until March 2019, following similar findings from the Nous Group Performance Assessment.

The Department provided framework templates and worked collaboratively with the GCs to develop these, supported by the GCAC.[92] The frameworks followed the four IGCI objectives and focused on outcomes. The GCs were provided with the flexibility to modify the documents to ensure they were measurable and meaningful. These were finalised in June 2019 for the end of 2018-19 financial year GCAC meeting.

Stakeholder consultation and GC documents indicate limited ownership, and low levels of attention being given to these documents by the GCs. While some GCs have tried to take their Frameworks seriously (and report against them), FIAL and AMGC were the only GCs to provide ACIL Allen with data aligned to their Performance Framework.

Further, there are issues with the ability of the GCs to implement the Frameworks, given the challenging KPIs and lack of access to data (e.g. BLADE). As a result, the Performance Frameworks are not used to drive performance and accountability by the Department or the GCAC.

The GCs are not contractually obliged to implement the Performance Frameworks. They were not anticipated to be available to support the Evaluation. However, it is in the GC's interests to be able to demonstrate that they have used Australian Government funds effectively and efficiently. Further, the findings from the Evaluation's assessment of the

[88] Ibid.

[89] See UK Department of Business, Energy & Industrial Strategy and Innovate UK (2017). *Catapult Programme: A framework for evaluating impact*. Accessed on 3 September 2020 at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/662319/catapult-programme-evaluation-framework.docx.pdf.

[90] Department of Industry, Innovation and Science (2018). Op. cit.

[91] UK Department of Business, Energy & Industrial Strategy and Innovate UK (2017) Op cit.

[92] Department and ACIL Allen discussion, 11 May 2020.

Performance Frameworks (Appendix C.4) can be used to drive the changes required to support any future evaluation. Any future funding of the GCs should be conditional on them developing a workable Performance Framework and collecting the necessary data. In the case of the UK, the Catapults have to collect performance data specified in their Performance Framework and use it to justify requests for continued support.

Key performance indicators and data collection

A detailed assessment of the IGCI and each GC's KPIs is provided in Appendix C.4. This has been included in an appendix, owing to its length. In summary, this analysis shows that:

— There is poor consistency between the KPIs in the IGCI Evaluation Data Framework and those in the GC Performance Frameworks, and poor consistency between the GC Performance Frameworks and Business Plans. Only AMGC and MTPConnect reference the Performance Frameworks in their 2020-21 Business Plans.

— KPIs in GC Business Plans focus on activities and operational performance rather than outcomes and impact.

— The GCs have taken different approaches to developing SCPs and complying with Annual Reporting, generally more in line with corporations' law reporting norms rather than government program requirements. This reflects that they are 'industry-led' entities with accountability to their industry partners as well as government.

— To demonstrate impact and attribution, Specific, Measurable, Achievable, Realistic, and Timely (SMART) KPIs need to be developed, focused on outcomes, and impact directly related to the IGCI objectives. This would enable comparison across GCs and a collective assessment of IGCI performance. However, given the advanced stage of program implementation the opportunity to develop/refine the necessary metrics may have passed.

The Evaluation has identified substantial differences in the approach taken by each GC and the absence of consistent measures in the Performance Frameworks. This severely limits assessment of the IGCI as a whole.

The detailed assessment of the data collection processes provided Appendix C.4 shows that:

— Data collection is a shared responsibility of the GCs, the Department and other government agencies.

— *There are significant gaps in data collected by the GCs* – several GC Performance Framework areas are not populated by any GC. Each GC has at least one area where other GCs have presented data, but it has not.

— *GC reporting tends to focus on inputs/activities* – there are few areas where the data are outcome- or impact-focused (mainly related to spillover effects).

— *There are cases of exemplar practice, which should be replicable by other GCs* – although rare, there are some areas where GCs report on outcomes. Other GCs should be able to replicate this approach.

4.4 Inter-GC and inter-agency cooperation

This Section examines the intra and inter-agency cooperation: those involved in collaboration, the structures in place to support this cooperation and their achievements. A mapping is provided in Table C.5 (in Appendix C) is ample evidence that GCs use a broad range of activities to work across their respective supply chains and ensure interagency cooperation around key/strategic issues. The GCs engage with federal and state government agencies, industry bodies and research organisations/ universities, individually and in a collaborative manner. There are joint initiatives between some GCs, which is a good sign of effective cross-sectoral collaboration and knowledge sharing. These are detailed below. Findings on the cooperation of the IGCI from other Australian Government programs evaluations are discussed in Section 6.2.5.

4.4.1 Cooperation between GCs and other agencies

The GCs were tasked with identifying industry needs to inform the strategic priorities of a range of policies and funding programs, including the ARC Industrial Transformation Research Program (ITRP), CRC, CRC-P, EP and SME Export Hubs Initiative.[93] This was intended to deliver scale and impact.

[93] Department of Industry, Science, Energy and Resources (2020). *Industry Growth Centres*. Accessed 26 February 2020: https://www.industry.gov.au/strategies-for-the-future/industry-growth-centres.

Relationships with other initiatives took time to establish. Relevant parties did not understand the accountabilities and constraints of government funding and the importance of communication.[94] Stakeholders are confused about where the IGCI fits into Australia's innovation ecosystem, with a number of industry stakeholders perceiving the IGCI to be "just another government program".

Some stakeholders noted that GC interactions on funding applications can be transactional, and engagement on sector issues can be opportunistic (e.g. when regulatory reform issues arise). In the absence of a clear role for the IGCI, the value contributed to the innovation ecosystem will be limited.

GC participants and the majority of industry and government stakeholders felt the GCs offer a unique value proposition as a coordinator and relationship broker across the sector. The effectiveness of this coordination role is contingent on GC leadership, networks, proactivity of staff and available resources. Findings on the cooperation between different programs are provided below.

CRC-P, CRC and ARC ITRP and Linkage

GCs collaborate with the Department, ARC, industry, and researchers/ universities to coordinate, support the development of, and review of proposals. The GCs were valued for facilitating connections. The funding guidelines require applicants to connect with GCs prior to submission and align their efforts to the relevant GC's key themes and Knowledge Priorities. Some GCs add value and facilitate connections over the life of a project.

Various levels of engagement were identified between individual GCs and CRCs. The CRC Association reports that CRCs have interacted with all of the GCs to varying degrees, with most interactions limited to the bid process (20 per cent of CRCs had this as their only interaction). Many CRCs indicated that their interaction with a GC was limited to a single instance, that deep, repeated relationships were extremely unusual and attempts to interact with GCs more deeply were rarely fruitful. NERA was identified as providing particularly meaningful and useful interactions, while FIAL's were cursory and less relevant. AustCyber was largely distanced from CRCs, with some stakeholders suggesting that it is competing in some areas. The GC Sector Competitiveness Plans are perceived by CRCs to be overly detailed and lacking prioritisation.

Further, several stakeholders identified an overlap with the research project funding of some GCs and CRCs, and significant perceived conflict of interest problems. More specifically, a number of stakeholders have pointed to perceived conflict of interest problems arising from the Miles report recommendation to involve the GCs in granting processes of other programs.[95] GC views on proposals are considered as part of the broader assessment performed by the Department and the CRC Advisory Committee. However, the Evaluation heard of examples where GCs had sought to discourage proposals because of commitments to back competing bids. In other cases, GCs were advising some applicants and then providing advice to grant selection committees on these *and other* competing applications. Miles recognised this problem in his report:

> *The review believes there may be limited scope for the Growth Centres to participate in the application and decision-making process …, where a Growth Centre is involved in assembling the consortia, assisting or driving the application, independent review will be an imperative.*
>
> *Miles Report (2015), page 29.*

GCs can assist applicants for CRCs, CRC-Ps and other grants but, having done that, they should not be providing advice to grant selection committees on the merits of these and competing proposals.

[94] Office of the Chief Economist (2016). Op. cit.

[95] Miles, D.A. (2015). *Growth through Innovation and Collaboration. A Review of the Cooperative Research Centres Programme*. Prepared for the Australian Government.

Entrepreneurs' Programme

GCs work with the Department to ensure the GC's long-term sector strategies are informed by insights from the EP. The GCs co-design and deliver skills workshops with EP's business advisors, co-fund high-potential commercialisation opportunities through the Accelerating Commercialisation Fund (particularly for SMEs) and deliver programs to improve business capability and commercial readiness. However, consultations with GC non-participants (all of whom were EP recipients) identified limited awareness of the GCs. This indicates that the EP is not championing the GCs to recipients and therefore not effectively channelling prospective participants to the GCs. This channelling will need to improve if the Department is seeking greater leverage from both the IGCI and the EP.

SME Export Hubs and Austrade Landing Pads

The GC cluster initiatives informed the design of the SME Export Hubs. The SME Export Hubs Initiative was designed to explicitly align with the IGCI, support Hubs in the six growth sectors and support SME development by working with the GCs. The GCs work with Austrade and the Export Council of Australia to support networking, and international export opportunities (e.g. building a 'Team Australia' presence at more than 40 international trade shows and delivering export readiness workshops).

CSIRO's Priorities and roadmaps

The GC Knowledge Priorities were originally intended to inform CSIRO's work, with CSIRO taking an active role in the Industry Innovation and Competitiveness Agenda, establishing the GCs, and aligning the CSIRO roadmaps with the SCPs. Although this engagement was driven from the corporate level in CSIRO, the Post-commencement Evaluation indicates this engagement has been challenging (the GCs and CSIRO business units do not easily match). The corporate-level imperative to engage has ceased in recent years, with connections occurring naturally, depending on the relationships between GCs and individual CSIRO business unit strategies and plans. The effectiveness of these connections varies by GC.

Other cooperative measures

Trade Barriers Register: initially launched by FIAL with support from the other GCs. The GCs collaborated with the Export Council of Australia to develop this Register of barriers to doing business overseas. This contributes to government understanding of the challenges faced by exporting businesses.

Accelerator Programs: for example, METS Ignited and NERA collaborated with KPMG, and the WA and Queensland Governments to deliver the RISE accelerator. This provides structure and support for SME growth and commercialisation skill development to build a sustainable innovation ecosystem.

Education and training: the GCs were intended to engage with the Industry Skills Fund and the then Department of Education and Training to seek input into the SCPs. The Post-commencement Evaluation indicated that better engagement could be achieved. This is now observed through AMGC and AustCyber working with TAFEs and universities to build course material and identify skills needs.
All GCs engaged with the Australian Industry and Skills Committee and the Industry Reference Committees (IRCs) to align the Vocational Education and Training (VET) sector with the needs of industry. Each GC (except FIAL) sits on at least one IRC.[96]

[96] Department of Industry, Innovation and Science (2019). Op. cit.

4.4.2 Cooperation between GCs

The GCs have engaged with each other on a range of programs, as follows:

— *Industry Mentoring Network in STEM (IMNIS) program,* METS Ignited, MTPConnect, NERA, and a range of partners, sponsors, and supporters. IMNIS prepares diverse, inclusive, and industry-ready PhD graduates nationally by matching students with industry leaders.

— *CORE Innovation Hub*, with METS Ignited and NERA: Australia's first co-working, collaboration and innovation hub focused on resources technology.

— *Industry 4.0 Advanced Manufacturing Forum*, with AMGC, AustCyber and MTPConnect: focuses on cyber resilience in medical devices and security in advanced manufacturing. AustCyber is the Australian lead for cyber resilience.

— *Market Insights and Information Portal*, led by FIAL and supported by the other GCs. This centralises market insights information to facilitate collaboration.

In addition, each GC engages with a range of industry bodies and other agencies (see the GC analysis attached to the main report (*unpublished*)). Further, the COVID-19 pandemic has created opportunity for the GCs to collaborate to address shortages essential items including ventilators (see Section 6.3).

5 Impact on Growth Centre Participants

This Chapter analyses the emerging impact of GC activities on participants. Initial impact has been assessed against the IGCI's objectives and TIS framework.

5.1 Key findings

This Evaluation has assessed only the IGCI's initial impact, at this time, in qualitative terms, based on preliminary or anticipated outcomes and impacts. This is due to limitations in the GC-collected data, the lag time required to observe impact and the delays in establishing the GCs, which have effectively shortened the time available to deliver impacts. This outcome is similar to the situation reported by EY in their review of the Catapults.[97] The Evaluation has been supported by the Department's quantitative BLADE analysis.[98] This has shown robust early evidence of impacts on GC-associated firms on a range of indicators, including that GC-associated firms are more likely to engage in R&D and be more innovative, have more trademarks, be registered with the RDTI program, be trade exposed, and show improved business performance in turnover, wages and employment growth.

All four objectives are being addressed by the GCs. However, there is a stronger achievement of impacts for Objective 1, increasing collaboration and commercialisation. The GCs are achieving impacts, although more varied, against Objectives 2, international opportunities and market access, and 3, management and workforce skills. In general, the GCs are not achieving much in relation to Objective 4, regulatory reform.

Assessment of impact on Dr Janssen's Technological Innovation System (TIS)[99] framework shows that funding and effort have been aligned with sector needs, and the effects follow inputs. The GCs have delivered strongly across most TIS elements, except for the '*guiding direction of search*' element where there is limited influence of the GCs on other government programs. Resource mobilisation has been strong, particularly for MTPConnect.

GC participants tend to be located in the same state as the GC head office and reflect the dynamics of the sector. Most participants are involved in the services sector, are SMEs,[100] and are more than six years old. Outcomes will likely be concentrated among those participants who have received the majority of GC effort.

The GCs have used different approaches and, as a consequence, the successes of each GC will likely be attributed to different factors.

The GCs were originally intended to become self-sustaining after four years. This always was unrealistic and did not align with the development of SCPs with 10-year visions. Although the GCs have leveraged additional revenue, a funding model with long-term government support is required to maintain their efforts and independence and ensure that the benefits of the IGCI are realised. However, while funding for some GCs has been extended under the MMS, ACIL Allen understands that

[97] Ernst and Young (2017). *UK SBS PS17086 Catapult Network Review*. London: Catapult Review Steering Group.

[98] Office of the Chief Economist (2020). Op. cit.

[99] Janssen, M. (2019). Op. cit. See also Appendix B.

[100] In this report, SMEs are defined as businesses with up to 200 employees.

the Department will ask all GCs to submit a plan in 2021-22 outlining the approach the GC will take to transition to a sustainable private sector model.

There is strong support for the GCs to continue. The IGCI is maturing and now starting to demonstrate signs of impact. Achieving measurable impact will take time and the GCs should be allowed the time to capitalise on their investments.

5.2 Achievements assessed against IGCI objectives

Table 5.1 presents an overall qualitative assessment of the impact delivered by each GC against the four IGCI objectives (see Box 2.1). This draws from the extensive desktop review, stakeholder consultation and the survey of GC participants. 'Ticks' (✓) indicate the degree to which a GC delivers low, medium or high impact. This assessment considers the quantum and range of work delivered, the potential magnitude of the outcomes and the relative importance to the sector (i.e. alignment to a knowledge priority). It has been informed by desktop review and stakeholder engagement. A snapshot of GC impacts is overviewed below and detailed in the GC analysis in a separate report. ACIL Allen has been unable to align the outputs/outcomes from activities across GCs due to lack of consistency.

ACIL Allen has not attempted to construct an overall evaluation metric to take in each of the sub-elements of the Evaluation. There are several reasons for this, including the diversity of activities between the GCs and the difficulty of weighting the contributions of the different sub-elements in an overall metric.

Table 5.1 Impact assessment against the IGCI objectives

GC	IGCI objectives			
	1. Increasing collaboration and commercialisation	2. Improving international opportunities and market access	3. Enhancing management and workforce skills	4. Identifying opportunities for regulatory reform
AMGC	✓✓✓	✓✓	✓✓	✓
AustCyber	✓✓	✓✓	✓✓	✓
FIAL	✓✓✓	✓✓	✓✓✓	✓
MTPConnect	✓✓✓	✓✓✓	✓✓✓	✓✓
METS Ignited	✓✓✓	✓✓✓	✓✓	✓
NERA	✓✓✓	✓✓	✓	✓
Overall assessment	✓✓✓	✓✓	✓✓	✓

Source: ACIL Allen Consulting 2020

5.2.1 Increasing collaboration and commercialisation

While all four IGCI objectives are being addressed, there is a clear emphasis on Objective 1, increasing collaboration and commercialisation, with all GCs delivering medium/high impact from the funding received. This may reflect industry priorities, combined with the probability that collaborative projects can be more readily executed and can deliver results in a shorter timeframe. Engagement with GC participants in particular, as well as industry and government stakeholders, highlighted the unique value proposition offered by the GCs in promoting collaboration and coordination across the sector. Many stakeholders feel this should be the GC's primary focus. As such, participants particularly value clusters/hubs, relationship brokering, grant funding and assistance with international marketing. The effectiveness of the coordination role is perceived to depend on the GC's personnel, networks and proactivity of state/regional staff.

Some stakeholders, particularly those from research organisations, believe that the GCs should play a role in bridging the commercialisation gap, through ecosystem growth and capacity building, but should not fund research (as this can overlap with other funding programs, such as CRCs). However, stakeholders value support for development.

The value of support for collaboration was evidenced in the survey of 788 GC participants (see Table 5.2). Participants valued the GCs providing thought leadership, opportunity and resources for ecosystem growth, influence and connections across the sector. The GC participant experiences varied across GCs, with AustCyber and AMGC participants more positive, on average.

Further, the GC participant survey shows that between 60 per cent (FIAL) and 84 per cent (AustCyber) of GC participants strongly agreed or agreed that the quality of their collaboration with external people and organisations had improved as a direct result of engaging with the GCs. This was most likely to occur with industry and the private sector (see Table 5.2) and was largely because:

the GCs provided networking opportunities that the participants did not have access to previously (29 per cent of IGCI respondents)

participants had a better knowledge and understanding of the sector and sector priorities (23 per cent of IGCI respondents).

Table 5.2 GC participant experiences of the role of the Growth Centre

Per cent agreeing/strongly agreeing	AMGC	AustCyber	FIAL	METS Ignited	MTPConnect	NERA
Providing thought leadership on sector priorities	82%	92%	70%	72%	77%	79%
Providing opportunity/ resources for ecosystem growth	80%	86%	62%	68%	74%	71%
Influencing government and industry associations	80%	86%	58%	67%	70%	70%
Providing connections to industry	80%	83%	57%	63%	67%	70%
Providing connections to the private sector	78%	80%	56%	58%	65%	68%
Providing connections to research bodies	77%	79%	55%	58%	64%	61%
Providing connections to governments	76%	77%	55%	57%	62%	59%
Providing connections to resources through the GC	75%	77%	54%	53%	61%	59%
Speaking for the sector as a whole	75%	74%	53%	52%	54%	59%
Providing connections to universities	72%	62%	52%	50%	54%	59%
Providing the opportunity to engage with investors	67%	55%	48%	47%	51%	48%
Influencing government and industry skills and training	51%	54%	42%	38%	48%	44%
Providing connections to non-profits	38%	43%	39%	25%	41%	34%

Source: Survey of GC participants

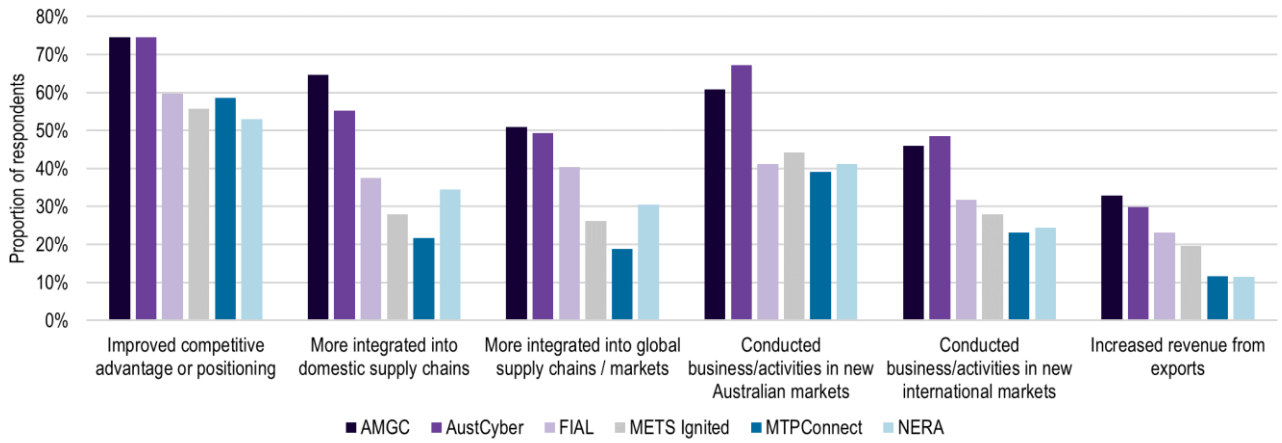
In comparison with the impact of the GCs on collaboration, fewer participants had improved their R&D and commercialisation activities since engaging with the GCs: between 47 per cent (METS Ignited) and 67 per cent (AMGC). Between 38 per cent (MTPConnect) and 66 per cent (AMGC) of participants had increased their commercialisation.

5.2.2 Improving international opportunities and market access

Impacts relating to IGCI Objective 2 are variable across GCs, reflecting respective sector-specific priorities (see Table 5.1). Some GC stakeholders perceive Objectives 2 and 3 to be natural outcomes of achieving Objective 1, that is, if the sector is well connected and able to commercialise, then market access and workforce skills develop naturally.

As a direct result of engaging with the GCs, most GC participants improved their competitive advantage or position (see Figure 5.1). In particular, survey respondents from AMGC and AustCyber were most likely to identify that through GC involvement they had become more integrated into domestic and international supply chains and conducted new activities in Australian and international markets. Participants were least likely to increase export revenue, which may reflect the lag time associated with achieving this longer-term impact.

Figure 5.1 Impact of GC participation on international opportunities and market access



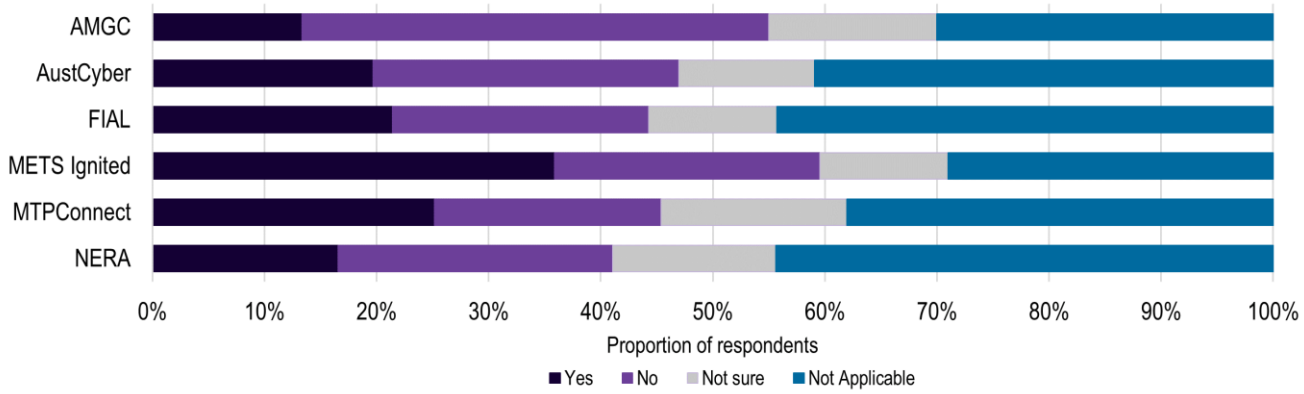
Source: Survey of GC participants

5.2.3 Enhancing management and workforce skills

Impacts for Objective 3 are variable across GCs, reflecting respective sector-specific priorities (see Table 5.1). Few participants benefited from GC-sponsored training and skill development, ranging between, 13 per cent (AMGC) and 36 per cent (METS Ignited) of participants (see Figure 5.2). Most participants did not perceive this to be applicable to their organisation. Of those that did benefit, most had engaged in management training and skill development, between 57 per cent (FIAL) and 88 per cent (AMGC). Between 25 per cent (NERA) and 57 per cent (AMGC) of participants identified an increase in the number of high-skill jobs as a direct result of engaging with the GCs.

This benefit was largely attributed to better access to higher quality training and skill development activities (49 per cent of IGCI respondents) and to funding to conduct more effective training and skill development (40 per cent of IGCI respondents).

Figure 5.2 Impact of GC participation on training and skills



Source: Survey of GC participants

5.2.4 Identifying opportunities for regulatory reform

Impact on regulatory reform falls well behind that relating to the other three objectives. Aside from work on a few specific regulatory issues, this is not a priority for any GC. The majority of stakeholders noted that the GCs lack the levers to address regulatory issues although they can perform awareness and advocacy roles. This is reflected in the survey of GC participants, which shows that, as a direct result of engaging with the GCs, 76 per cent of participants had not experienced

(or was not applicable) a reduction of burden from government regulations and compliance, and 82 per cent had not experienced (or was not applicable) reduced business costs due to better regulatory reform.

5.3 Achievements assessed against the TIS framework

The collective impact (from all GCs, effectively a proxy for the IGCI impact) has been assessed against the TIS framework, based on individual GC assessments (see Table 5.3 and the GC analysis attached to the main report (*unpublished*)). For each TIS element, necessity, inputs and effect has been rated on a low, medium, high scale.

— *Necessity*: high or medium/high for all TIS. In general, GCs are of the view that all TIS elements are important and should be addressed. The GCs have considered this in designing work programs.

— *Inputs:* these tend to align with necessity except for the '*guiding direction of search*' TIS element. GCs are directing funding and effort across the TIS, delivering a holistic response to identified need (determined by the Knowledge Priorities). The low/medium impact arising from the '*guiding direction of search*' is due to the complicated relationship the IGCI has with other government funding programs and the limited ability of the GCs to provide funding to influence direction of research.

— *Effect:* GCs have delivered strong effect across all TIS elements. The GCs use a common approach based on the Knowledge Priorities; test labs, clusters, incubators and accelerators; supply chain studies and access initiatives; funding leverage and Project Funds to drive change. Impact generally aligns with the need and inputs used to address the issues.

Insight as to overall actions and achievement of impact according to the TIS is provided below. In general, stakeholders perceived knowledge development and exchange to be the primary areas of focus for the GC's efforts and impacts.

Table 5.3 Impact assessment against TIS elements

IGCI (collectively)	Necessity	Inputs	Effect
Entrepreneurial experimentation	Medium/High	Medium/High	Medium/High: new technology; test labs; clusters; incubators; accelerators; new start-ups; test labs
Knowledge development	Medium/High	Medium/High	Medium/High: Industry Knowledge Priorities driving investment; project support for R&D; CRCs/ARC engagement
Knowledge exchange	High	Medium/High	High: clusters/hubs; targeted communications and engagement; Masterclasses and information exchange
Guiding direction of search	Medium	Low	Low/Medium: Knowledge Priorities; engagement and influence; exploring synergies between GCs, limited influence on government programs
Market formation – connection of supply chain	Medium/High	Medium/High	Medium/High: supply chain understanding; formation of new market opportunities; trade missions, promotions and displays
Resource mobilisation – leverage, mobilise participants	High	Medium/High	Medium/High: leveraging of industry funding and support; alternate funding sources; skills and training
Legitimation/counteracting resistance	Medium/High	Medium	Low: address cultural barriers; independent honest broker; driving regulatory reform

Source: ACIL Allen Consulting 2020

5.3.1 Entrepreneurial experimentation

Project funding has supported industry-led research projects and research/collaboration hubs aimed at fostering product/service innovation and enhancing global reach. Initiatives have directed support to start-ups and scale-ups focused on innovative solutions. GCs have facilitated the development of test labs and test beds to provide for technical validation.

GCs have supported industry-led innovation through clusters, accelerators, quality incubators, and innovation hubs. These initiatives have supported collaboration and entrepreneurship in all sectors and seek to build an innovation infrastructure that supports entrepreneurs from conceptualisation and R&D through to commercialisation and export.

Some notable impacts/potential impacts include:

— MTPConnect has made major efforts to support entrepreneurial training, investment and incubators, with 54 new start-ups attracting investment of $31.4 million.

— FIAL has supported companies to generate between 40-60 new products for each of the first three years, which rose sharply to 120 in 2019-20.

— NERA's SPEE3D developed new high-speed, low-cost metal 3D printing technology (far cheaper and 1,000 times the speed of conventional metal 3D printing) which may revolutionise industrial activities in remote areas (allowing onsite parts production), with broad application across industries.

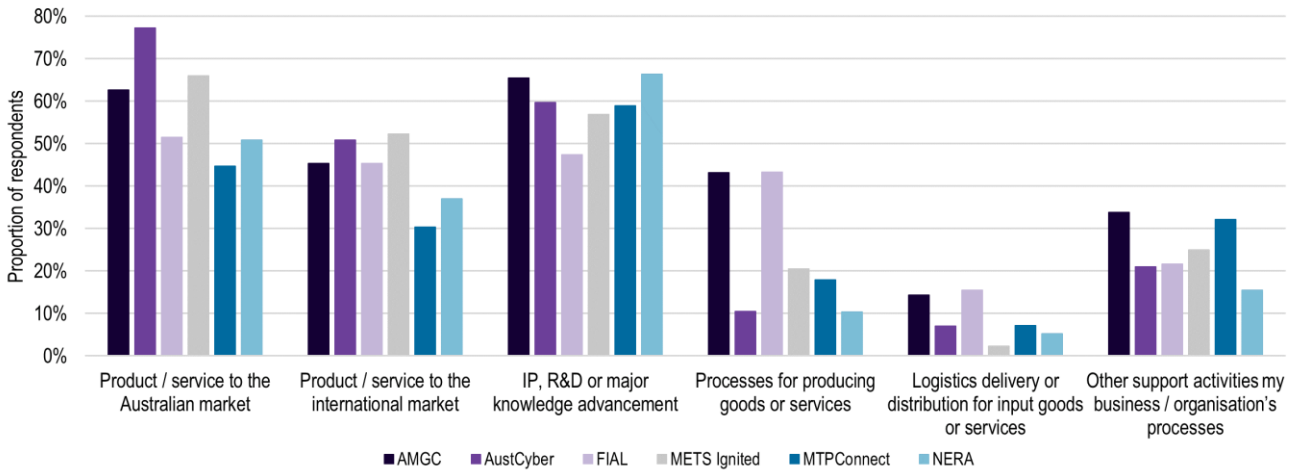
The survey of GC participants shows that as a direct result of engaging with the GCs, participants were most likely to develop new products and services to the Australian and international markets and develop IP, R&D or major knowledge advancements (Figure 5.3). They were least likely to develop logistics delivery or distribution for input goods or services. While results varied across GCs, of note, AMGC and FIAL participants were more likely to develop processes for producing goods and services.

Further, between 27 per cent (MTPConnect) and 65 per cent (AMGC) of participants agreed or strongly agreed that their interaction with the GCs caused them to introduce new business practices. Between 19 per cent (MTPConnect) and 55 per cent (AMGC) of participants had introduced new methods of organising work responsibilities/decision making.

5.3.2 Knowledge development

All GCs have identified Knowledge Priorities based on extensive stakeholder consultation. This is reflected in the survey of GC participants, which shows that most participants in all GCs consider that the Knowledge Priorities are clear and focus on important issues for their sector and organisation, and reflect their needs and the diversity of participant organisations (see Figure 5.4). These Knowledge Priorities guide Project Fund allocations and management/business model priorities. Some GCs have extended the understanding of Knowledge Priorities by assessing the innovation infrastructure capabilities of their sector (e.g. FIAL's Infrastructure Capabilities report).

Figure 5.3 Impact of GC participation on entrepreneurial experimentation



Source: Survey of GC participants

Some notable impacts/potential impacts for knowledge development include:

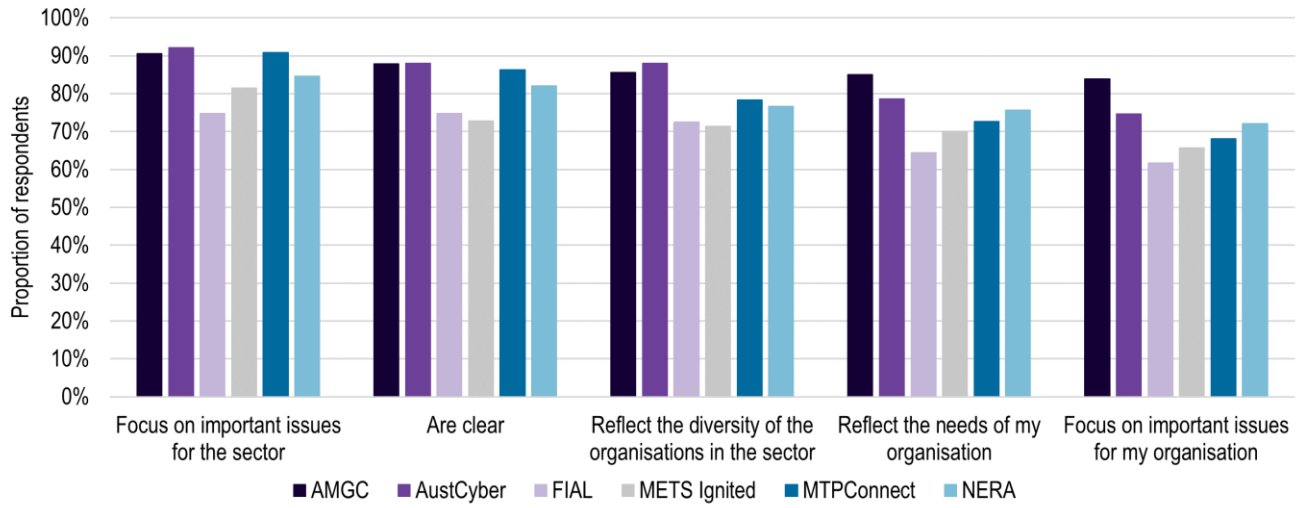
— AustCyber has invested significant resources in education and training for schools, VET and university. Over 30,000 students and 1,000 teachers participated in CyberTaipan (a proven framework for educating and inspiring students towards further study and careers in cyber security and STEM).

— MTPConnect support has resulted in 125 new patents/trademarks.

— NERA has focused on converting strategic research into capabilities and technologies that support the development and efficiency of Australia's onshore gas industry, improving economic outcomes, unlocking resources, and commercialising R&D. Work on enhancing well deliverability could generate OPEX savings of $100 million per annum; the deployment of the Solar Hybrid Wellsite project outcomes could reduce generator operating and maintenance costs by 40-50 per cent.

— FIAL has committed over $9 million in Project Funds toward collaborative projects, with over $50 million expected in commercialisation benefits. FIAL's Enterprise Solutions Centre is connecting SMEs with R&D expertise and short-term funding to support access to technology and upskill staff. Seventy-five SMEs have generated new products with potential sales of over $50 million.

Figure 5.4 Impact of GC participation on knowledge priorities



Source: Survey of GC participants

5.3.3 Knowledge exchange

All GCs have extensive communication and engagement strategies targeted at participants and the broader sector. Engagement has focused on sharing insights and ensuring market activities and Knowledge Priorities align with industry needs. GCs have sought to establish a national presence, especially in states with significant sector activity. Collaboration has focused on hub/clusters, events and workshops, and collaborations with industry bodies, state governments, and other GCs.

Some notable impacts/potential impacts include:

— MTPConnect has conducted 242 collaboration events with 13,746 attendees to ensure that the outcomes from project funding are promulgated widely. Further, MTPConnect has secured $32 million in Department of Health funding for the Researcher Exchange and Development within Industry Initiative, which works with eight industry and research partners to drive skill development.

— FIAL's *Celebrating Australian Food and Agribusiness Innovations* showcases 50 innovative companies across the entire value chain, which act as exemplars for the sector (published annually).

— NERA is looking to share its work to expand the knowledge base on decommissioning, repurposing and life extension which could generate cost savings of $2.4-4.2 billion.

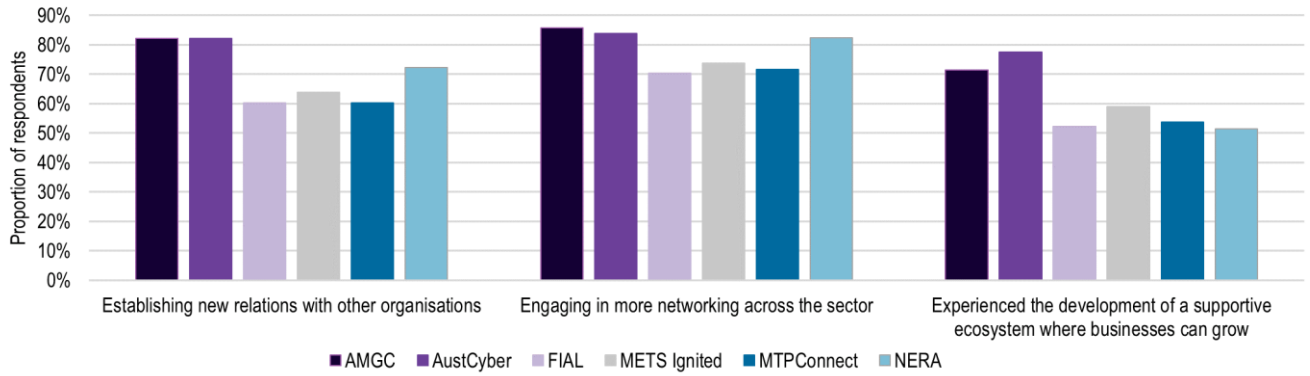
The GC participant survey supports these findings, as most participants have established new relationships, engaged in more networking and experienced the development of a supportive ecosystem where businesses can grow (see Figure 5.5). AMGC and AustCyber participants were the most positive.

5.3.4 Guiding direction of search

The Knowledge Priorities have guided GC projects and initiatives. Some GCs have worked together to steer research to better align with industry needs (e.g. METS Ignited and NERA). Supply Chain studies and the like have helped focus key areas of R&D necessary to realise opportunities. AMGC has identified the characteristics of a high performing industry and endeavoured to develop strategies and workplans that drive industry to adopt these characteristics more explicitly and regularly. FIAL has been influential in re-aligning some CSIRO divisions.

For the small number of businesses who participated in a GC Project Fund grant and were consulted for the Evaluation, the influence of the GC is significant with respect to the TIS element. These businesses identify the critical role of GCs in shaping R&D projects and in helping businesses to find collaborators and research partners that progress their commercialisation ambitions. Further, the Department's BLADE analysis shows that,[101] compared with non-recipients, one, two and three years following award, grant recipients showed stronger additionalities across key performance indicators of turnover, wages and exports. This tended to improve significantly over time.[102] METS Ignited collaborated with the Queensland Government to identify industry challenges and opportunities and to support SME METS companies to expand and grow their organisations through an Accelerator Program.

Figure 5.5 Impact of GC participation on collaboration and knowledge exchange



Source: Survey of GC participants

On face value, the work of the GCs influencing the agendas of the broader research community are impressive. GCs tend to focus on start-ups and SMEs working in the appropriate sector. A number of programs (e.g. CRCs, EP, SME Export Hubs, ITRP) require applicants to indicate alignment of their projects with relevant GCs, and to consult with the GCs before submitting applications. In practice, consultations with GC participants, non-participants and relevant industry and research associations show that this is often not much more than a 'tick box' exercise. This is best evidenced by the survey of and consultation with non-participants: most non-participants interviewed were unaware of the IGCI and GCs.

5.3.5 Market formation – connection of supply chain

GCs have worked to broaden industry knowledge of export opportunities and help industry develop products and skills to enter domestic and international supply chains. As discussed for Objective 2 (international opportunities and market access), as a direct result of participating in the GCs, participants have become more integrated into domestic and international supply chains and conduct new activities in Australian and international markets (see Figure 5.1). Some GCs have contributed to market formation through their work in establishing cluster, hubs and living labs/test labs focused on nascent sector opportunities. AMGC commissioned extensive research which identified the need for a more sophisticated understanding of the advanced manufacturing supply chain to drive profitability and competitiveness. This research has been central to their work, which seeks to link traditional manufacturers to pre-and post-manufacturing suppliers/ service providers to enhance export and commercial opportunities.

[101] Office of the Chief Economist (2020). Op. cit.

[102] Ibid.

All GCs have supported efforts to grow exports, including attendance at domestic and international trade shows, trade missions etc. For instance, MTPConnect led or directly supported 23 trade missions involving 850 companies, including delegations to BioJapan, BioKorea and International BIO.

NERA's SME ConnectER program avails the opportunity for more than 40 businesses to build and grow relationships across the supply chain (facilitated meetings and pitch sessions for operators, tier one contractors and large specialised service providers). The METS Ignited International Markets initiative established services and supports for companies to explore international markets. FIAL has supported the numbers of participant firms exporting (new products/services) to new international markets, increasing from 19 to 25 per cent between 2018-19 and 2019-20.

5.3.6 Resource mobilisation – leverage, mobilise participants

All GCs have leveraged industry funds for Project Fund projects (see Section 4.2.3). Most GCs have mobilised additional funding and/or in-kind contributions from the Australian and state governments, industry bodies and research organisations for a range of projects and initiatives. In total the GCs have leveraged $388.9 million. This is significant considering the GCs have expended only between 49 per cent (AustCyber) and 77 per cent (FIAL) of their IGCI funds. The leveraged figures will likely increase as the GCs commit the remainder of their funds.

In addition to the funding leveraged by the GCs, the businesses which they have assisted have been able to raise significant additional funding. For example, ACIL Allen was advised that one AustCyber recipient raised $280 million as a result of their assistance and MTPConnect participants collectively raised more than $103.5 million. Table 5.4 shows that MTPConnect has been the most successful, leveraging $272 million, largely through programs delivered on behalf of the Department of Health (e.g. Biomedical Translation Bridge, BioMedTech Horizons, Researcher Exchange and Development within Industry and Targeted Translation Research Accelerator).

Table 5.4 GC overall leveraging of IGCI funds

GC	Leveraged funding for Project Fund projects ($)	Other leveraged funding ($)	Total leveraged funding
AMGC	17,340,084	4,052,269	21,392,353
AustCyber	15,013,746	0	15,013,746
FIAL	17,840,378	3,929,948	21,770,326
METS Ignited	21,966,677	5,000,000#	26,966,677
MTPConnect	35,800,000	236,300,000^	272,100,000
NERA	26,399,209	4,975,000	31,374,209
Total	**142,251,464**	**256,222,678**	**388,874,142**

Note: other leveraged funding includes funding from industry, federal and state government and other agencies.

Includes $5 million allocated by the QLD government. This excludes $5 million of assumed industry funding to match METS Ignited's core funding for the TAMM project.

^ This includes $1.2 million from the Western Australian Government and funding from MRFF for: BMTH1-3 ($45 million), BTB ($22.3 million), REDI ($32 million) and the TTRA ($47 million). Further, through the MRFF funds, MTPConnect has leveraged an additional $88.8 million in funding for projects awarded up to August 2020.

~ This excludes a total of $18,004,202 in in-kind contributions leveraged through the Project Fund and AMESRF.

Source: ACIL Allen Consulting 2020

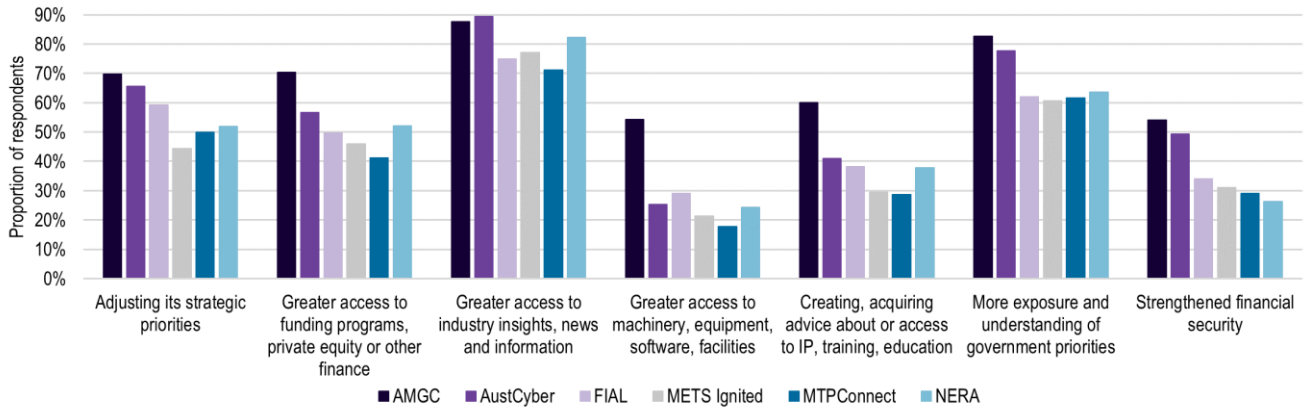
ACIL Allen believes that there would be merit in looking to establish an incentive mechanism that encourages GCs to maximise other sources of income, although funding of the size and nature that MTPConnect has secured is generally not available in other sectors. Other GCs have typically secured funding for smaller and more targeted programs (e.g. clusters/hubs or workshops). This is in contrast to the Catapults and Topsectors, that have more opportunity to leverage significant resources from other government programs.

Some stakeholders consider that GC funding programs are inefficient because they have often been too small and have had very short application deadlines and high overheads.

The GCs provide a centralised information resource for their industry sector. This is reflected in the survey of GC participants, which shows that, as a result of being involved in the GCs, participants consider that they have greater access to industry insights, news and information and more exposure and understanding of government priorities (see Figure 5.6).

This is supported by consultations with government officials, who stated that the GCs had helped to inform their understanding of various sectoral issues. Participants were least likely to have gained greater access to machinery, equipment, software and facilities. Participants from AMGC were the most positive.

Figure 5.6 Impact of GC participation on resource mobilisation



Source: Survey of GC participants

5.3.7 Legitimation/counteracting resistance

The GCs have sought to tackle cultural and other impediments to sector development, in particular practices that hinder competitiveness. For instance, FIAL has addressed cultural barriers prevalent within the food and agriculture sector, resulting in improved collaboration and sharing. Within the oil and gas sector, NERA has devised initiatives to drive traditional competitor companies to work together to address sector wide issues. However overall, such activities are considered less important by GC participants, with between 30 per cent (METS Ignited and MTPConnect) and 49 per cent (AMGC) having experienced reduced resistance to change as a result of participating in the GC.

In practice, there are some perceived or actual competitive tensions between established industry bodies, GCs and government which prevent the GCs from fully leveraging their position. Some industry associations see the GC's modest resources as limiting their scope to influence the ecosystem. The GCs' need to become self-sustaining is perceived to drive competitive behaviours, which compromise GC independence and hinders their ability to counter resistance. Most stakeholders perceive the need for long term government funding to maintain the independence and standing of the GCs. This enables them to act as an honest broker and legitimises their role in addressing issues without a vested interest. It has also enabled the GCs to advance thinking, including some policy and regulatory approaches, across government and more broadly.

The GC leadership is perceived to be important in countering resistance in the sector. Leadership quality has been variable across the GCs. Where GCs have faced internal conflict on strategic direction, they have been less effective in countering sector resistance.

GCs tend to thrive where there is stability in the Managing Director (MD) position and the MD has a good working relationship with a strong/effective Board Chair. Only some GCs have experienced these leadership conditions.

5.3.8 Magnitude of the changes

The potential magnitude of change is difficult to observe at present due to poor data collection and the GC's long-term focus. It is unlikely that real progress on the GC objectives will be observed for at least 5 years from the time the GCs began implementing their work programs (which is typically one-to-two years after GCs were established). Further, the GCs are involved in activities impacted by many extraneous factors (e.g. world trade, the pandemic, political and policy settings). It is very difficult to determine cause and effect across broad systems with complex dynamics. So, while GCs may have a positive impact, this might be lessened by, or further amplified by unrelated factors.

Despite these challenges, there are positive signs from GC documentation and GC stakeholder consultations that a number of GC-participating firms have grown their businesses considerably (revenue and employees), accessed capital and new domestic and international markets, undertaken workforce training and improved their skills, and developed new products, services and intellectual property. Many stakeholders directly attributed these benefits to the relevant GC. This aligns with the improvements seen in the Department's BLADE analysis,[103] in terms of improved engagement in R&D, and firms demonstrating that they are more innovative, have more trademarks, are registered with the RDTI program, are trade exposed, and show improved business performance in turnover, wages and employment growth.[104]

The potential for the GCs to contribute to the growth of their sectors is huge. The GCs have set ambitious 10-year visions in their SCPs. While it is unclear how much of this vision is achievable, the potential magnitude is large.

The GCs, as with their international comparators the Catapults, Topsectors and SIPs, are still at the early stages of operation. They have made strong progress in engaging and connecting traditionally fragmented stakeholders, and dismantling sectoral silos. However, in general, limited progress on the broader objectives has been demonstrated to date. All the performance reviews have indicated that it is too soon to observe system-wide changes in competitiveness, productivity and skill.[105,106,107] These reviews have reinforced the need for longer-term horizons for government funding, and strong performance monitoring.

5.4 GC participation

According to the GC Program Logics, the GCs were broadly tasked with driving coordination and collaboration across the private sector (i.e. in multi-national enterprises, SMEs and start-ups), universities and research organisations, governments, industry bodies, and non-profit organisations.[108] While some collaborations are common across GCs, such as with Australian Government funding programs, the GCs have also had some engagement with sector-specific stakeholders.

5.4.1 GC interactions data

There are inherent limitations to characterising the interactions between the GCs and their stakeholders. Based on advice from the Department,[109] we understand that the stakeholder data provided by each GC has limitations. This is largely due to the range of definitions used for 'interactions', the completeness of the data, GCs collecting different types of information and the differing quality and intensity of these interactions.

ACIL Allen understands that a new CRM is being used to collect standardised participant data. This should help to inform future assessment of the characteristics and performance of GC stakeholders.

5.4.2 GC participant characteristics

IGCI Project Fund data provides consistent information on the geographic distribution of Project Fund lead participants across the GCs. Funding has largely been allocated to four states: Victoria, WA, Queensland and NSW, with limited funding granted to projects led from ACT, Tasmania and NT (see Figure 5.7). When examined across GCs, AMGC and FIAL have the most diverse geographic spread. In contrast, 49 per cent of AustCyber project funding has been to projects in NSW, 56 per cent of MTPConnect funding has been to projects in Victoria and METS Ignited and NERA have made significant investments in WA (43 and 61 per cent, respectively). These investments broadly align with the dominant location of sector

[103] Office of the Chief Economist (2020). Op. cit.

[104] Ibid.

[105] Dialogic (2017). *Topsector Approach Management Summary*. Netherlands: Dialogic.

[106] OECD (2016). *OECD Reviews of Innovation Policy: Sweden 2016*. Paris: OECD.

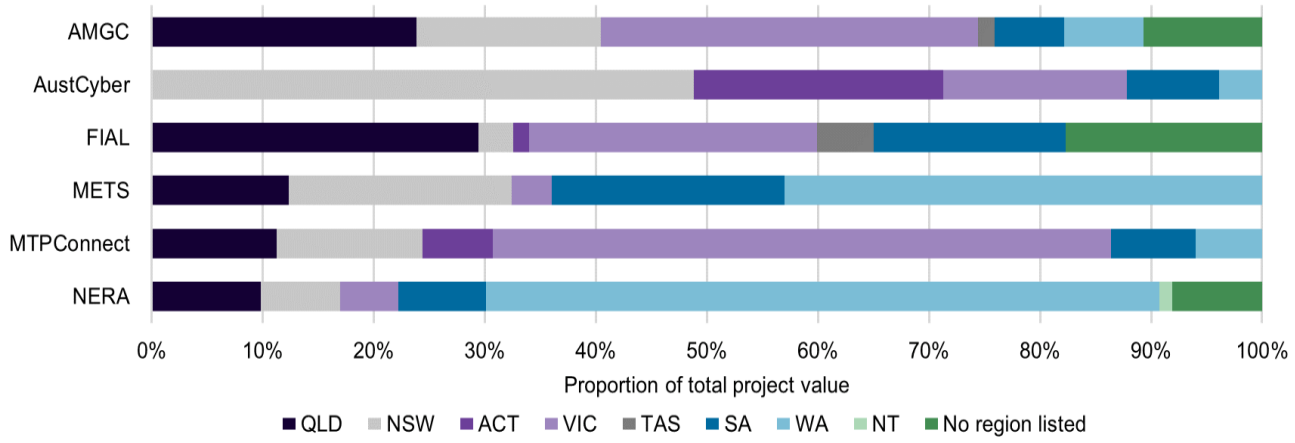
[107] Ernst & Young (2017). Op. cit.

[108] Department of Industry, Innovation and Science (n.d.). *A- Evaluation Strategy…* Op. cit.

[109] Correspondence with Business Intelligence and Reporting, Data Management and Analytics Branch (Data Branch), Analysis and Insights Division, Department of Industry, Science, Energy and Resources, 3 June 2020.

participants and potential markets. These findings broadly correlate with the Department's geographic assessment of GC participants.[110]

Figure 5.7 Proportion of GC's total project value by state and GC



Note: Projects approved/announced/ finalised/executed projects for all years. Location is based on the location of the project lead.

Source: ACIL Allen Consulting 2020, Department data to June 11, 2020.

GC-identified participant profiles

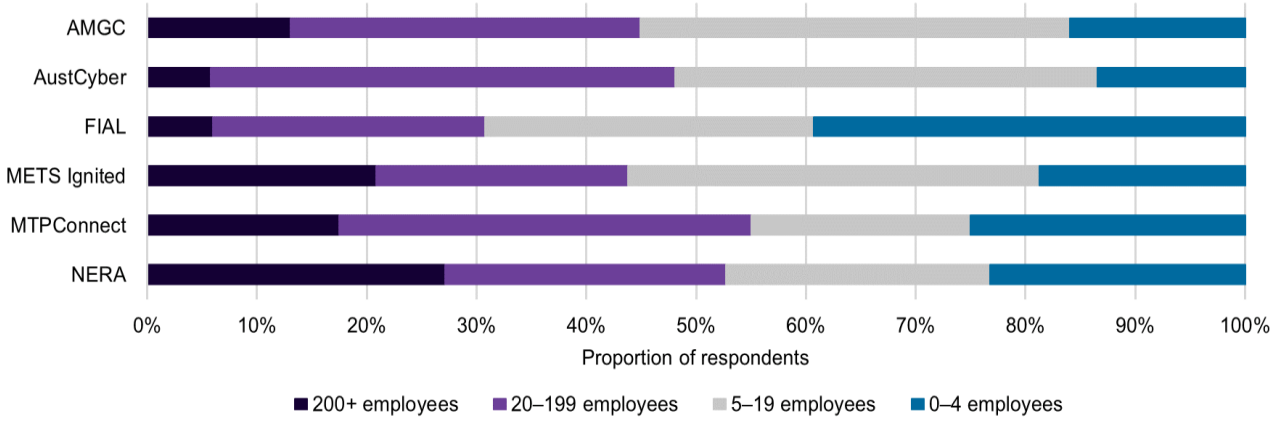
The Department's analysis of GC participant firm-level data shows that the GCs work with a diverse range of participants.[111] In general, participants are distributed across manufacturing (from 6 per cent for NERA to 36 per cent for AMGC) and professional services (from approximately 50 per cent for FIAL to 100 per cent for AustCyber). Most participants are more than 6 years old (between 73 per cent (AustCyber) and 92 per cent (FIAL)). The Department's analysis found that, across other government programs, participants most commonly participate in the R&D Tax Incentive, from 10 per cent (METS Ignited) to 21 per cent (AMGC) and a large proportion of AMGC participants are recipients of the EP (14 per cent). However, there were substantial differences in the distribution of organisations by: size, industry and exporter status. The proportion of small organisations ranged from 45 per cent for AMGC to 55 per cent for AustCyber.

The employment profiles reported in the Department's analysis are different to those of the survey of GC participants conducted for the Evaluation.

[110] Department of Industry, Science, Energy and Resources (2020). *IGC ABN program interactions for Evaluation team – Executed DISER Grant Agreements, 30 March 2020*. Canberra: Australian Government.

[111] Office of the Chief Economist (2020). Op. cit.
Firm-level data (i.e. ABN and interaction type) was available for the financial years 2015–16 to 2018–19 (1,046 from AMGC, 242 from AustCyber 777 ABNs from FIAL, 5,576 from METS Ignited, 3,340 from MTPConnect and 995 from NERA).

Figure 5.8 Survey respondents by size



Source: Survey of GC participants

Figure 5.8 shows that between 73 per cent (NERA) and 94 per cent (AustCyber and FIAL) of private sector organisations were SMEs (0-199 employees). These differences could result from either the:[112]

— sample size of the BLADE analysis (11,976) and survey of GC participants (788)

— selection strategy, as BLADE analysis was conducted on the Department's IGCI program participation data linked to firm level micro-data from the Australian Bureau of Statistics BLADE. The survey was sent to GC-identified stakeholders.

BLADE analysis[113] shows that approximately 30 per cent of AMGC, FIAL, METS Ignited and NERA-participants are exporters, while only 19 per cent of MTPConnect participants and 11 per cent of AustCyber participants are exporters. Further AMGC, METS Ignited and NERA have a greater proportion of exporters in the '$100,000 plus' export class (85, 78 and 80 per cent, respectively), while only 59 per cent of AustCyber participants are in this class.

ACIL Allen analysis of 709 unique organisations (approximately 6 per cent universities and research institutes) interacting with the six GCs shows that 17 per cent of organisations engage with more than one GC. Most of these organisations engage with two or three GCs (10 and 4 per cent, respectively).[114] These figures are higher in the survey of GC participants, with 27 per cent of respondents participating in two GCs, and 10 per cent in three. This ranges between 18 per cent (FIAL) and 46 per cent (METS Ignited) of GC participants engaging in more than one GC (see Figure 5.9).

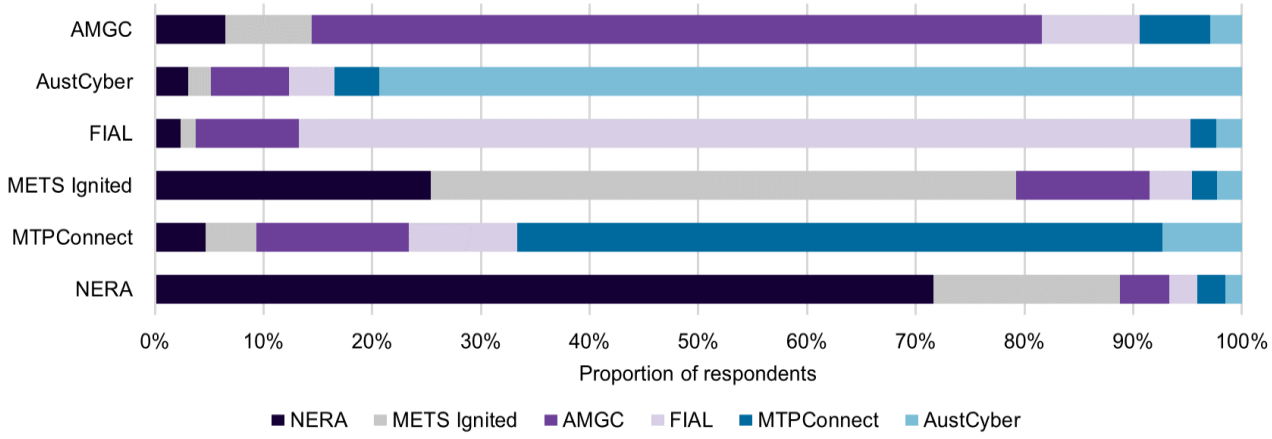
The reach of each GC is difficult to estimate and cannot be compared due to the range of different activities undertaken by GCs. It is clear that the GCs are engaging broadly across the sectors, and their activities are receiving 'buy-in'. All stakeholders consulted perceive that the IGCI is significantly underfunded — it cannot achieve reach or scale and the GCs lack the resources to achieve the impact originally expected by the Government. Stakeholders feel this is particularly true when comparing IGCI funding with that available to similar initiatives in other countries.

[112] Office of the Chief Economist (2020). Op. cit.

[113] Ibid.

[114] Department of Industry, Science, Energy and Resources (2020). *IGC ABN program interactions*… Op. cit.

Figure 5.9 GC participant interactions across GCs



Source: Survey of GC participants

5.5 How and why the outcomes are achieved

Many GC participants consulted feel the GCs had been critical to their development and successes. Without the GCs, many stakeholders feel their business would be significantly less advanced, competitive or collaborative, and the sector would be more fragmented.

> *"[The GC] was a key reason that we have been successful …. it's not about the reports and what's on their website and those things, they are all very good, it's been very much the reaching out from the direct assistance that they have provided across-the-board. And I don't know how with such little resources they get around to so many of us" (CEO, 7-year-old business).*

> *"All of the impact that we've had, and I believe we've been one of the single most impactful organisations founded in the last 3 years, all of that impact wouldn't have happened without the GC's initial program grant, and that includes supporting over 320 companies" (CEO, 3-year old business).*

Some stakeholders feel that selected activities delivered by the GCs could be delivered by other organisations, but in a slower and less coordinated way.

5.5.1 Factors contributing to the outcomes

Identifying factors that contribute to GC outcomes is challenging due to the range of possible confounding factors that may have influenced performance over the short timeframes being considered. Further, end beneficiaries of GC-sponsored activities are often unaware of the input from the GCs, which complicates attribution. This is because some of the activities supported by GCs are delivered by third parties.

The following factors contribute to the GC outcomes:

— AMGC invested substantially in its establishment. By taking a methodical approach to defining the sector and identifying the priorities, AMGC developed a clear strategic pathway and consistent messaging to drive impact. AMGC has built substantial brand reputation in the sector and among government. The cross-sectoral nature of AMGC increases the potential for reach and coordination.

— AustCyber invested considerable effort in building the innovation infrastructure that supports entrepreneurs from ideation and R&D through to commercialisation and export. AustCyber is well connected to Austrade, CSIRO and education bodies, increasing its influence.

— FIAL invested significant resources in understanding the sector composition and challenges (e.g. SME-heavy, diverse focus that spans industries). FIAL has focused on shifting the prevailing culture of the sector to create greater

collaboration and competitiveness, and on building capability (e.g. through workshops, clusters, trade shows). FIAL employs multiple data platforms to support strategic planning.

— METS Ignited recently created a strong focus and clarity for the sector in transitioning to future technologies. The work program, secured through the Queensland Government, has provided an additional revenue stream to expand METS Ignited's influence. Further, METS Ignited has focused on under-served areas, including regional Australia, where funding may achieve a relatively higher return.

— MTPConnect has secured funding from the Department of Health, which has significantly boosted the ability of MTPConnect to direct funding to priority areas. On the whole, MTPConnect has built trust in its reputation, and believes that it has developed good working relationships with regulators.

— NERA has focused strongly on collaboration and commercialisation and strategically aligned with government agencies and policies. By investing in research, and using this to guide the strategic direction, NERA has identified critical, large-scale national problems requiring support.

5.5.2 Concentration of outcomes

Stakeholders generally believe that the GCs are delivering effort (and are likely to deliver outcomes) that is concentrated among start-ups and SMEs with growth potential (as noted in Section 5.4.2). This aligns with the Department's BLADE analysis, which shows that ~75 per cent of GC participants are SMEs (see Section 5.4.2).[115]

GCs are focussing on bridging the translation gap from research to product development and export. GCs are working predominantly with stakeholders located in major cities. While there has been concerted effort to engage with regional stakeholders (e.g. through METS Ignited's regional workshops and capacity building exercises), the GCs' reach is limited by their resources and the location of their staff. The evidence suggests that the further a stakeholder is from a GC contact point, the lower is their awareness and engagement.

It is likely that the GC outcomes will be concentrated among participants that have experienced high levels of engagement. This includes, for example, project funding, involvement in hubs and clusters, facilitated introductions with potential collaborators, training and education and accelerators.

5.6 Self-sustained funding

All stakeholders who commented on self-sustaining GCs strongly agree that self-sufficiency is unrealistic. Several stakeholders noted this would compromise the independence of the GCs, because securing industry funding through membership or fee-for-service models has the potential to compromise their independence. In some sectors, research organisations and industry representatives/bodies perceive that the need to become self-sustaining has been driving undesirable behaviour choices by the GCs. This is having a negative impact on some sectors by creating competitive tensions with established sectoral organisations.

In the original GC applications and again in the business case for two years of additional funding, the GCs proposed a range of models to become self-sustaining post-government funding. These included securing fees through memberships; user pay activities, brokering fees and sponsorship. Most identified this as a key risk that would compromise the GC's 'independent voice'. However, while funding for some GCs has been extended under the MMS, ACIL Allen understands that the Department will ask all GCs to submit a plan in 2021-22 outlining the approach the GC will take to transition to a sustainable private sector model.

The GCs failed to meet the original timetable for becoming self-sustaining (four years) and are unlikely to be in a financially sustainable position at the end of the additional two years of funding (not even MTPConnect). Noting that none of the international comparators operate on a purely self-sustaining funding model, and given the GC's current remit, ACIL Allen's view is that it is unlikely the GCs will become self-sustaining.

International comparators operate on a hybrid public-private model. This may be possible for some GCs if public funding sources are available. A mixed funding model with long-term government funding may be the most pragmatic funding

[115] Office of the Chief Economist (2020). Op. cit.

approach. One possible approach could be the UK Catapult's 'one third model' (see Appendix D), that is, sourcing one third of funding each from:[116]

- core public funding: long-term investment to develop infrastructure, expertise, and skills
- collaborative applied R&D projects (competitive), funded jointly by the public and private sectors (national and international)
- R&D contracts, funded by business or independently.

However, the ability of the Catapults to earn revenue from R&D contracts is based on their government-supported investment in state-of-the -art capital equipment. In the absence of such investment by the GCs, GC contract research is not going to be a source of revenue. Further, GC involvement in contract research is likely to put them in competition with CSIRO and the rural R&D Corporations (in the case of FIAL). Further, the Catapults and Topsectors have access to a range of funding mechanisms that are not available in Australia.

MTPConnect has been most successful in securing a supplementary revenue stream. MTPConnect has secured a total of $236.3 million, across four strategic funding programs (and associated leveraged funding) for the Department of Health. This includes $1.2 million in Western Australia Government funding. However, the management fees for these programs are only sufficient to cover MTPConnect's costs to deliver these programs, and could not be used to support MTPConnect's broader activities.

5.7 Ongoing need for the Initiative

Consultations across GCs, industry, government and GC participants overwhelming identified an ongoing need for the IGCI to support the six growth sectors. The small minority that did not believe the IGCI should continue all supported the need for government intervention through a different industry growth strategy. The survey of GC participants showed that across the IGCI, 81 per cent (512 of 631) of respondents agreed that their sector still needs the IGCI (see Table 5.5). This ranged from 94 per cent for AustCyber (60 of 66) to 74 per cent (51 of 69) for MTPConnect. Further, a largely majority of non-participants agreed that industry-led programs are the best way to address sectoral issues and believe that it is necessary for the Australian Government to support sectors with potential competitive advantage (see Section 6.1.1).

Table 5.5 GC participant reflections on the IGCI and GCs

% positive	AMGC	AustCyber	FIAL	METS Ignited	MTPConnect	NERA
It is appropriate for the government to continue to support the sector through the IGCI and GC	88%	95%	79%	82%	75%	79%
The sector still needs the IGCI and GC	88%	94%	78%	78%	74%	78%
It was necessary for the Australian Government to support the sector by setting up the GC	88%	91%	76%	77%	74%	78%
The GC is a good, targeted policy approach to growing the sector	84%	89%	70%	65%	74%	70%
The GC is performing well	83%	88%	68%	63%	70%	68%
The IGCI and GC-approach is the best way to address the issues in the sector	80%	83%	63%	52%	61%	66%

Source: Survey of GC participants

The announcement of the MMS (designed to be led by industry, for industry)[117] and alignment of the GC's priorities with the National Manufacturing Priorities, reinforces the value of an industry led approach. Stakeholders consultations took place prior to the October 2020 Budget announcements, and thus their comments do not reflect the announcement of the MMS.

[116] Catapult (2020). *Funding*. Accessed 6 April 2020: https://catapult.org.uk/about-us/funding/.

[117] Department of Industry, Science, Energy and Resources (2020). *Manufacturing a new future for Australia*. News, 6 October 2020. Accessed 9 November 2020: https://www.industry.gov.au/news-media/manufacturing-a-new-future-for-australia.

Two stakeholders suggested that it might be possible to amalgamate some GCs or to change the focus of others. ACIL Allen is not generally attracted to these suggestions. As noted earlier in this report, the original selection process was based on expert advice and the current GCs should be given the opportunity to deliver on the objectives agreed by the Department. Changing direction at this stage could be a serious distraction and put longer-term activities at risk.

System, Sectoral and Broader Economic Impacts 6

This Chapter considers the initial impacts from GCs that flow beyond their direct participants, that is, the spillover on to the broader innovation ecosystem, sectors, and economy. It discusses Departmental work and ABS data sources that could inform future assessment of spillover impacts. It also provides short case studies of the GC's broader activities, collaboration and impact relating to the COVID-19 pandemic.

6.1 Key findings

The initial impact of the GCs on sector-wide improvement may be limited given the short duration of operation, the GC's long-term visions, limited funding to achieve reach across stakeholders and scale, poor connectivity with other innovation programs, and the potential for COVID-19 to offset part of the gains generated by the GCs. In addition, attributing performance improvement to the GCs has limitations.

Delivering impact and scale will depend on the GC's clearly defining their unique value proposition among the suite of government programs, and coordinating with these programs to support participants to access the right kind of support from ideation to commercialisation and export.

The COVID-19 and bushfire responses of the GCs demonstrate how the GCs can collaborate to support Australia during such crises. The responses demonstrate that the GCs are increasingly looked to by government as an entry point for sectoral input. The extent to which the GCs have been able to help stakeholders survive these crises will be another measure of their success.

6.2 Measurement of sectoral and broader economy impacts

Dr Janssen's methodology requires measurement of wider or structural changes for assessment of impact on knowledge production and economic structures. This assessment relies on stakeholder consultation, survey data from GC participants and non-participants, and BLADE.[118] Findings from the evaluation of other government innovation programs are discussed below. Comments are also made on the potential use of Business Characteristics Survey (BCS) and Computable General Equilibrium (CGE) modelling.

6.2.1 BLADE

The Department has conducted firm-level analysis of the characteristics and performance of the IGCI using micro-data available from BLADE.[119] BLADE enables data linkage of characteristics such as firm size, age, industry sector, geographical location, turnover, foreign ownership, and export/import status. The analysis cross-referenced the GC firms' participation in other Department programs (RDTI, EPCRCs, CRC-P). Comparison was made of firm-level indicators between GC participants and non-participants to determine whether the participants progress more quickly. This analysis shows that, on average, GC participants:

[118] Office of the Chief Economist (2020). Op. cit.

[119] Ibid.

— engaged in more R&D, have more trademarks and were more likely to register with the RDTI program
— were trade exposed (either exporting goods and services or importing goods)
— showed improved business performance in turnover, wages and employment growth.

Further, ANZSICs with a high proportion of GC-participating firms were more likely than all firms analysed to be innovative, conduct a higher proportion of R&D, collaborate for innovation, have active trademarks and patents and have higher wages, turnover and employment. In contrast, impact on export sales growth is mixed and only a few ANZSIC divisions associated with the GCs show above-average management capability scores.

6.2.2 Consultation with, and surveys of GC participants and non-participants

Consultation and survey data provide some indication of the value of industry growth strategies, and the impact of the IGCI more broadly. There is value in an annual survey of GC participants, such as the one developed for the Evaluation, to track performance.

GC participant perspectives of the GC's broader impacts are outlined in Table 5.2, Chapter 5. Participants perceive that the IGCI has had a positive impact on the sector, particularly by providing thought leadership on sector priorities, opportunities and resources for ecosystem growth, and influencing government and industry. These perceptions are likely to be influenced by direct engagement of participants with the GC's marketing and awareness raising activities.

Most stakeholders consulted believed that the GCs are significantly underfunded and lack the resources required to reach a broad range of stakeholders in their sectors. Such coverage is required to achieve the scale of change that was originally intended from the IGCI. The GCs have expended considerable effort to engage broadly across Australia (i.e. through regional and state managers). This has helped these GCs to engage with stakeholders locally. However, as previously noted, the further a stakeholder is from a contact point, the lower their awareness and engagement.

These results are supported by consultations with and a survey of non-participants. Despite being involved in the innovation ecosystem through the EP program, most non-participants consulted have no awareness of the GCs and 82 per cent of non-participants surveyed have not (to the best of their knowledge) participated in the activities of any of the GCs. This is significant, as awareness is central to the GC's reach and effectiveness. Limited awareness likely results from a number of factors, including the limited resources the GCs have to broadly influence the sector, poor referral between programs (i.e. from the EP to the GCs) and that end users and beneficiaries of GC efforts may not be aware of GC involvement because the GCs often work in collaboration with other organisations.

Consultations showed that strong relationships with other government programs (notably the EP), industry associations, state and territory agencies and other organisations are essential for championing the GCs. This increases the awareness and reach of the GCs. If GCs have limited or competitive relationships with such organisations, then they will not champion the GC or refer their stakeholders to the GC (thus limiting the awareness and reach of the GCs). The Department and other government agencies could better leverage the suite of their innovation programs. This would improve the reach and scale of program impact and reduce confusion as to the unique value proposition of the IGCI, as distinguished from it being 'just another government program'. One of the key programs that could interface more effectively with the IGCI is the EP. That most non-participants have not heard of the GCs is a failing to capitalise on the strengths of the high-profile EP, to champion the IGCI and refer EP participants to the GCs.

For those non-participants that were aware of the GCs, most did not participate because the GCs were not relevant to their organisation or the particular activities they were undertaking. A minority had been in conversation with the GCs and had not been successful in converting this into more a productive relationship or been able to secure Project Funds.

This is supported by the survey of non-participants which shows that most respondents do not participate in GCs because they do not feel included in the focus of the GC (15 per cent) or can secure the benefits offered by the GCs through other avenues, including funding, training and education, industry insights, news and information (all 12 per cent). Non-participant respondents who were aware of the GCs:

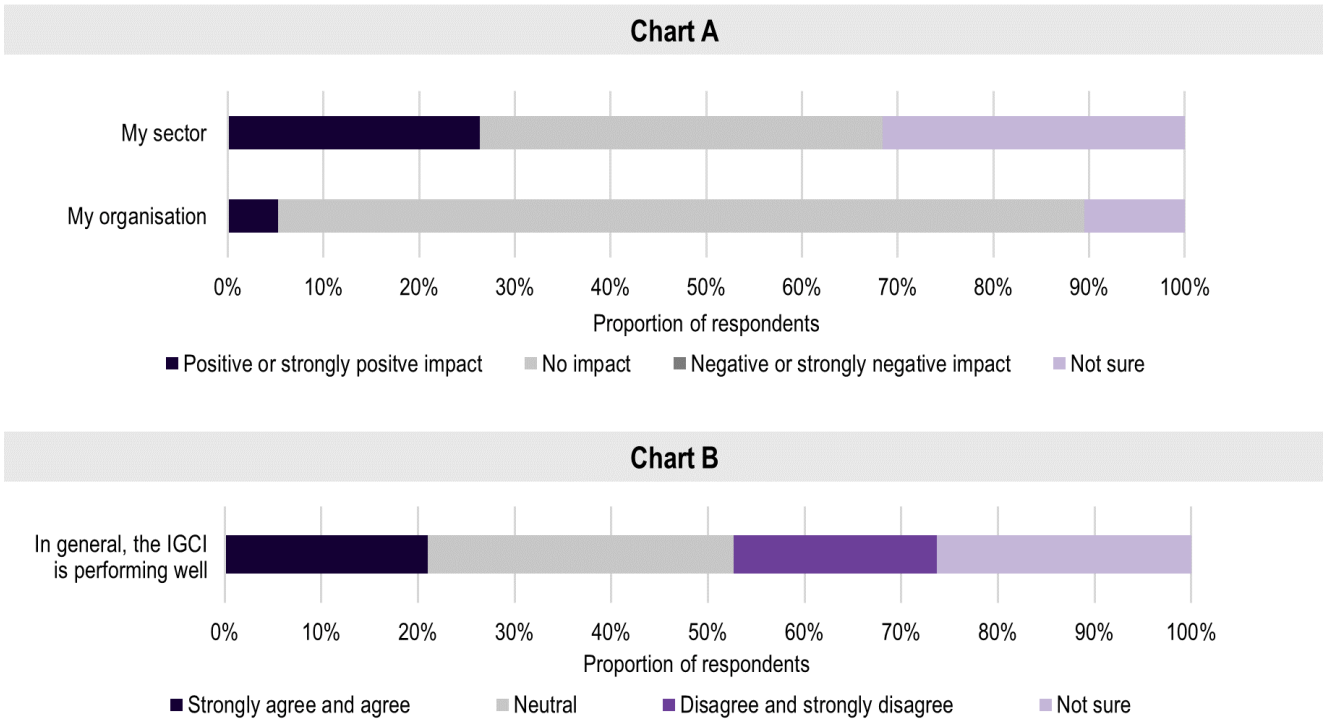
— perceived the GC activities (63 per cent) and impacts (58 per cent) to be restricted to participants
— were not confident commenting on the GC's impact on the four IGCI objectives, with 26-32 per cent selecting 'not sure' and 42-53 per cent selecting 'neutral'

— perceive that the GCs have had no impact on their sector (42 per cent) or organisation (84 per cent) (see Figure 6.1 Chart A)

— disagree or strongly disagree that the IGCI is performing well (21 per cent), although many respondents were neutral or unsure (see Figure 6.1 Chart B).

— when asked to reflect on industry growth more broadly (see Figure 6.2), non-participant respondents were positive about the role industry-led initiatives in providing a targeted policy approach to growing sectors (77 per cent), believe it is necessary for the Australian Government to provide support for sectors with potential comparative advantage (73 per cent), and feel industry-led programs are the best way to address sectoral issues (91 per cent).

Figure 6.1 Non-participant's views on IGCI impact on industry growth

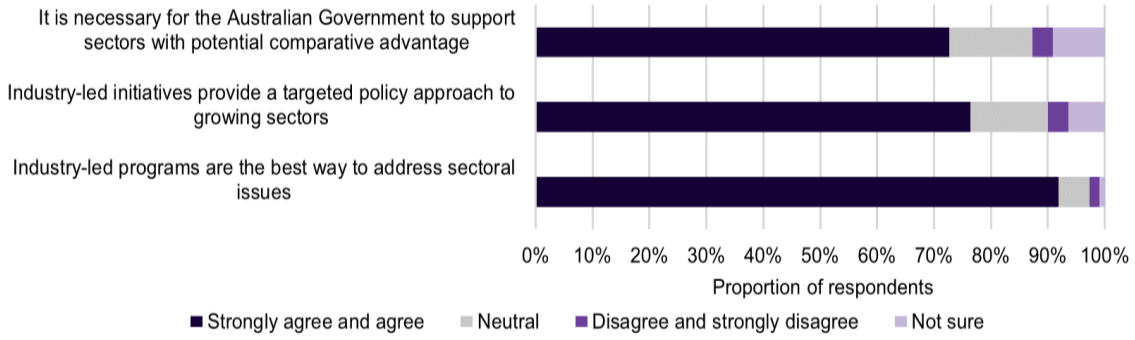


Note: Responses to survey question "In general, the Industry Growth Centre Initiative is performing well:", "The Industry Growth Centre Initiative has impacted on my organisation:" and "The Industry Growth Centre Initiative has impacted on the sector in which my organisation operates:" n=19 respondents.

Source: Survey of non-participants.

In the absence of the IGCI, most non-participants perceived their sector would 'be about the same'. These results speak to the broader sectoral awareness of the activities and outcomes of the IGCI.

Figure 6.2 Non-participant's reflection on the policy rationale for the IGCI



Note: Responses to survey question "On reflection:" n=110 respondents.

Source: Survey of non-participants.

6.2.3 The ABS Business Conditions Survey

The department's Evaluation Data Framework suggests using ABS data to assess performance. These data are from a sample of firms collected through the BCS. The BCS could be used to track changes in the growth sectors over time. However, the BCS small sample size and timing (undertaken every second year, the most recent was 2018-19) limits its usefulness, as the available information does not allow for assessment of IGCI impact over its short lifespan to date.

Sector definitions are based on ANZSIC codes, which are contestable. For example, MTPConnect's sector spans multiple industry codes but the GC focuses on selected areas. Further, advanced manufacturing and METS are not currently defined by ANZSIC codes. Relevant BCS data is not available for AustCyber. Importantly, each GC was initially tasked with clearly defining its sector. These definitions could guide future data collection.

Although the BCS data could not be used for the Evaluation, supplementary administration of the BCS to the growth sectors by the ABS may help inform any future evaluation. The information available through BCS and BLADE will need to be considered in terms of their completeness and granularity once all data have been analysed. This will inform which data are most promising for any future evaluation.

6.2.4 Computable General Equilibrium analysis

In theory, CGE economic modelling may help to understand spill-over effects from the GCs on the broader economy. By modelling the interaction of GC sectors with the broader economy, CGE could measure supply chain and broader economic impacts of the IGCI. A limitation is that, as with the BCS, CGE relies on impacts to be specified in terms of ANZSIC industry codes. An indicative assessment might be constructed using the ANZSIC-based sector definitions, or using information on the industry codes reported by participants of the GCs.

An alternative approach to specifying direct impacts by ANZSIC could be to model the impact of improved attraction of capital, or input-output efficiencies. Again, this would rely on broad-based input assumptions which may be based on measured reputational impacts of Australian industry. Where specific technological advances are attributable to the GCs, the impacts of these across industries (and the flow on effects of those efficiencies) may also be measured.

6.2.5 Analysis of other Australian Government programs

The Department has conducted analysis on the RDTI, SME Export Hubs Initiative, and the EP. These have been made available to inform the wider impacts of the IGCI, where appropriate. The ARC's evaluation of the ITRP has also been considered.

Overall, the analyses demonstrate poor connectivity with other innovation programs, including participants' understanding of the role of each initiative, and participant engagement across multiple initiatives. There is value in clarifying the pathways or relationships between the IGCI and other programs using the TRLs and CRI (see Section 3.3.3).[120]

R&D Tax Incentive

Departmental analysis shows that a relatively high proportion of GC participants conduct R&D and were registered with the RDTI: between 9.6 per cent (METS Ignited) and 20.5 per cent (AMGC).[121] GC-participating firms have higher R&D expenditure compared to non-GC firms in the RDTI. GC participants comprise only 8 per cent of the RDTI firms, yet account for 21 per cent of total R&D expenditure. However, as the Department notes, the role of the IGCI or RDTI in increasing R&D expenditure cannot be easily attributed to either program.

The Department is considering whether it can use RDTI data to see whether economic structure changes have occurred. This would investigate whether research topics are becoming more closely linked to the GCs' research agendas, and whether firm collaborations are becoming more diverse (i.e. more inclusive of diverse firms across the economy).

[120] Morrison, S. (2020) Op. cit.

[121] Office of the Chief Economist (2020). Op. cit..

SME Export Hubs

The 2020 post-commencement evaluation[122] of the Department's $20 million cooperative initiative found that the SME Export Hubs align with the strategic policy objectives of the IGCI. However, there has been a lack of clarity on the role of the GCs in the innovation ecosystem (and potential overlap with the Hubs) and in supporting and advising on Hub applications. There has been varying levels (quantity and quality) of engagement with the GCs. This may be a result of geographical challenges and insufficient resources on the part of the GCs. Engagement was more positive if there were existing relationships between the Export Hubs and the GCs. However, poor coordination between the Hubs, the GCs and the Department has led to inefficiencies.

A small proportion of GC participants (3 to 3.6 per cent over the period 2015-16 to 2018-19) received Austrade's Export Marketing Development Grants (EMDG). As a proportion of GC exporter status, this overlap was around 13 per cent.

The Evaluation recommends that the Department leverage programs, including the IGCI, to build collaboration and share learnings among the Export Hubs.

Entrepreneurs' Programme

The Department delivers the EP, a flagship initiative to build capability and innovation at the firm level. The 2020 monitoring evaluation did not include a focus on the IGCI; however, some findings were made in relation to the growth sectors and GCs.[123]

The monitoring evaluation found that 69 per cent of EP participants operate in industry classes aligned with Advanced Manufacturing; Food and Agribusiness; Oil, Gas and Energy Resources and Cyber Security. Only a small proportion of the 366 GC-participating businesses interact with the EP, from 1 per cent for Oil, Gas and Energy Resources to 7.1 per cent for Advanced Manufacturing. Further, 20 per cent of participants in the Business Management program are 'enablers' of the growth sectors rather than direct participants.

The Department's analysis shows that between 3.5 per cent (AustCyber) to 8.9 per cent (AMGC) of GC participants were participants in EP grants and between 1.8 per cent (AustCyber) to 13.9 per cent (AMGC) of GC participants were participants in EP services.[124]

Industrial Transformation Research Program

The ARC delivers the ITRP, which aims to find solutions to industry problems and transform Australian industries by supporting collaboration between university researchers and industry. The ITRP's key growth areas align with the IGCI. The 2019 evaluation of the Program's process and priorities found:[125]

- stakeholders saw benefits in the scheme's interaction with the key growth areas of the IGCI, which focused the ITRP's research
- the GCs were involved in identifying and enabling partnerships, supporting ITRP application and program design, and providing market advice
- most stakeholders found GCs easy to reach and responsive, with engagement extending beyond the program development phase
- GC stakeholders felt that engaging in the ITRP supported both programs to achieve their objectives.

[122] Deloitte (2020). *Post-Commencement Evaluation: SME Export Hubs Initiative for the Department of Industry, Science, Energy and Resources (Unpublished)*. Melbourne: Deloitte. CONFIDENTIAL.

[123] Department of Industry, Innovation and Science Evaluation Unit and Nous Group (2020). *Entrepreneurs' Programme: Programme Monitoring Evaluation (Unpublished)*. Canberra: Department of Industry, Innovation and Science.

[124] Office of the Chief Economist (2020). Op. cit.

[125] Australian Research Council Program Evaluation Section (2019). *Evaluation of the Industrial Transformation Research Program process and priorities*. Canberra: Australian Research Council.

In contrast:

— there was uncertainty about the role of the GCs in the ITRP application and assessment processes
— the key growth areas were perceived by some stakeholders to be narrow or to have gaps
— while 71 per cent of university stakeholders consulted with GCs, only 30 per cent of ITRP grant Partner Investigators consulted with GCs
— industry Partner Investigators felt the GCs were more useful in identifying university partners than university stakeholders felt they were for identifying industry partners
— some stakeholders had difficulties contacting and engaging with the GCs.

The evaluation recommended that the ARC improve the flexibility and clarity of the ITRP and the role of GCs, and that the ARC work with the Department and GCs to emphasise the value of engaging with the GCs. This awareness is needed for GC participants as well, with Departmental analysis showing that only 3.2 per cent of GC participants received ITRP grants.[126]

6.3 COVID-19 emergency response

In the past year, Australia has faced major challenges — severe drought, extensive bushfires and the COVID-19 virus. Each challenge has created significant economic problems. The drought reduced primary production and may have slowed investment in productivity-enhancing measures in the agricultural sector. The bushfires exacerbated primary production challenges and destroyed property. The COVID-19 pandemic has had a broader negative impact on Australia's economic performance.

The GCs and their stakeholders have been impacted by these problems. Many of the businesses that the GCs work with have struggled to survive. The GCs have recognised the risk that this poses to the economy and have responded in two main ways:

— implementing measures to help their stakeholders survive, including emergency funding programs, networking and information support
— contributing to cross-sectoral responses to COVID-19 through government taskforces, thus leveraging their networks to quickly respond to emerging events.

These responses are outlined below.

6.3.1 Measures to support stakeholders

Some GCs have offered direct assistance to their stakeholders to address COVID-19 related challenges. For example, NERA has invited businesses to bid for funding to provide solutions to these challenges. NERA is providing $20,000 to up to ten businesses, which can offer solutions, services or knowledge to help manage and mitigate Australia's COVID-19 challenges.[127]

FIAL launched a Black Summer Innovation Fund[128] in late February, which is providing grants of up to $25,000 to businesses which have been negatively impacted by the bushfires and COVID-19. These grants are supporting the development of new goods and services in food and agribusiness.

[126] Office of the Chief Economist (2020). Op. cit.

[127] NERA (n.d.). *COVID-19 projects announcement*. Accessed 17 June 2020 at https://www.nera.org.au/News/COVID-19-projects-announcement

[128] FIAL (n.d.). *What is the Black Summer Innovation Program (BSIP)?* Accessed 17 June 2020 at https://fial.com.au/Attachment?Action=Download&Attachment_id=8397

AustCyber has partnered with Deloitte to deliver a series of webinars[129] to help Australia's cyber security industry and related businesses survive the pandemic period. Australia's cyber security sector has a high proportion of relatively new companies that may be particularly vulnerable and need additional help to 'weather' the pandemic and position themselves for when the economy recovers.

FIAL is working with governments to establish a central coordination point for food rescue and relief for families impacted by the pandemic.[130] FIAL is using its networks to collect produce and food from farmers and growers across Australia, including from sources not currently able to sell through their usual channels (such as restaurants).

FIAL has provided two Frost and Sullivan infographics[131] that provide valuable insights into the food and beverage sector, and the short- and long-term implications of COVID-19. They highlight supply chain growth opportunities and digital technologies being used to address disruption in the sector.

METS Ignited[132] and MTPConnect[133] have published details of support and resources available to businesses on their websites. MTPConnect has been providing direct advice and sector updates to governments to support Australian research, medical, MTP manufacturing and supply chain efforts. In relation to clinical trials, MTPConnect supported ARCS Australia to provide a free 10-week webinar series: *COVID-19: considerations and strategies for running trial during the pandemic*.[134]

The GCs have also worked together to provide goods and services needed to respond to COVID-19. A COVID-19 Manufacturer Response Register[135] was launched in late March, hosted by the AMGC, in cooperation with the other GCs. This Register aims to coordinate support for the COVID-19 response by matching supply with demand. Users can search and filter listings and companies can post a need, solution or capability. More than 2,500 companies have registered. This allowed the healthcare system to request support to meet the significant increase in demand for protective, medical and critical care equipment. This resource is expected to be useful well beyond the current pandemic.

6.3.2 Contributing to cross-sectoral responses

The Australian Government Departments of Industry and Health Taskforce was established to bring government agencies and private sector organisations together to ensure the supply of healthcare technologies, goods and services to support the public health response to COVID-19. MTPConnect was involved with the Departments' Taskforce from the outset, with its Chair, Sue MacLeman, playing a significant role on the working groups on ventilators, testing kits, personal protection equipment and (with Dan Grant) other intensive care unit equipment. Other MTPConnect staff were also involved.

COVID-19 caused disruptions to the workforce and supply chains. Reductions in the availability of air freight services and shortages of shipping containers have impacted on production inputs and outputs. Businesses have faced challenges sourcing inputs to production and producing goods and services for clients. The GCs have used their collective resources, skills and networks to help address some of the major social and economic challenges facing Australia at this time. By exchanging information to identify priorities and urgent or high impact issues, the GCs have avoided duplication of effort.

AMGC helped create consortium to build life-saving ventilators. A group of Australian manufacturing companies secured a $31.3 million government contract to build ventilators as part of Australia's response to the COVID-19 crisis. Supported by the AMGC and the Victorian Government, the NOTUS Emergency Invasive Ventilator Program will see 2,000 ventilators

[129] AustCyber (n.d.). *COVID-19 : How to apply the stimulus packages to enable your business strategy now and beyond*. Accessed 17 June 2020 at https://www.austcyber.com/resource/covid-19-how-apply-stimulus-packages-enable-your-business-strategy-now-and-beyond

[130] FIAL (n.d.). *Food waste roadmap*. Accessed 17 June 2020 at https://fial.com.au/food-waste-roadmap.

[131] FIAL (n.d.). *FIAL website*. Accessed 17 June 2020 at https://fial.com.au/Attachment?Action=Download&Attachment_id=8427 and https://fial.com.au/Attachment?Action=Download&Attachment_id=8413.

[132] METS Ignited (n.d.). *COVID-19 support and resources for the Australian METS sector*. Accessed 17 June 2020 at https://metsignited.org/covid-19-support-and-resources-for-the-australian-mets-sector/.

[133] MTPConnect (n.d.). Accessed 17 June 2020 at https://www.mtpconnect.org.au/Story?Action=View&Story_id=249.

[134] Ibid.

[135] AMGC (n.d.). *COVID-19 manufacturer response*. Accessed 17 June 2020 at https://www.amgc.org.au/covid-19-manufacturer-response/.

manufactured.[136] AMGC's COVID-19 Manufacturer Response Register was critical in bringing together 20 manufacturers to form the consortium. Led by technology commercialisation experts Grey Innovation, this involves several AMGC members. ANCA and Marand will manufacture and assemble thousands of critical parts, while Bosch is manufacturing the test equipment required to verify the ventilators.

With time to market critical, Grey Innovation secured a certified mechanical ventilator design from a prominent medical device company under licence for production in Victoria. The 2,000 ventilators will contain 99 per cent Australian manufactured content. On 9 April 2020, the Minister for Industry, Science, Energy and Resources commented:

> *"This is another great example of Australian industry and the private sector working with our Government to ensure critical supply of medical equipment during the outbreak of this virus.*
> *This deal demonstrates the power of bringing Aussie manufacturers and clinicians together and is also a reflection of the highly advanced manufacturing capability that exists in our country. It also shows the incredible collaborative spirit that's been on display as we respond to this unprecedented pandemic. Companies which are normally in competition are working together for the greater good."*
>
> *The Hon Karen Andrews MP*[137]

The COVID-19 Manufacturer Response Register connects 2,500 suppliers with those in need of supplies. The Register provides a longer-term solution to matching supply and demand. This is being explored with CSIRO to broaden the scope of the Register to support broader emergency responses, and issues beyond emergency responses.

AMGC's support for the Prefab Innovation Hub (announced on 31 July 2020) will support collaboration between industry and researchers and the development of new technologies and innovations that provide smarter, cheaper, faster and more sustainable construction solutions. Such innovative prefabricated building solutions can be used to support emergency responses to and rapid recovery from natural disasters.

Australian 3D-printed nasal swabs help solve supply chain problems. Rapid upscaling of laboratory testing for COVID-19 has led to an acute global shortage of nasal swabs. Melbourne company 3DMEDitech has designed and 3D-printed nasal swabs for use in COVID-19 testing to meet shortages in the national stockpile. Using specifications made available by US investigators, four prototype designs were prepared and 3D-printed by 3DMEDitech.

3DMEDitech was a member of the Industry and Health Taskforce working group on testing kits and worked with Victorian researchers to make further modifications to the design.[138] The 3DMEDiTech swab was validated for testing in an *in vitro* validation study reported in the *Medical Journal of Australia*.[139] The 3DMEDitech swabs matched the performance of imported swabs.

Given the widespread availability of 3D-printing capacity, 3DMEDitech's work may enable many countries to ensure 'sovereign supply chains' of swabs. The scalability of the technology means that, depending on local capacity, thousands of swabs can be produced each day. The Government has recently announced a $3.7 million contract to purchase this product.

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[136] Grey Innovation (2020). *Grey innovation secures 31m federal government contract for industry consortium to build ventilators in Victoria,* media release 9 April 2020. Accessed 17 June 2020 at https://www.greyinnovation.com/newsroom/article/21/grey-innovation-secures-31m-federal-government-contract-for-industry-consortium-to-build-ventilators-in-victoria.html.

[137] Hon Karen Andrews MP (2020). *Industry consortium manufacturing 2000 ventilators*, media release 9 April 2020. Accessed 17 June 2020 at https://www.minister.industry.gov.au/ministers/karenandrews/media-releases/industry-consortium-manufacture-2000-ventilators.

[138] Medical Journal of Australia media release (2020). *COVID-19 local 3D printed nasal swabs may solve supply chain problems*, 27 May 2020. Accessed 17 June 2020 at https://www.mja.com.au/journal/2020/covid-19-local-3d-printed-nasal-swabs-may-solve-supply-chain-problems.

[139] Williams E et al. (2020). *Pandemic printing: Evaluation of a novel 3D printed swab for detection of SARS-CoV-2*, preprint published online 27 May 2020. Accessed 17 June 2020: https://www.mja.com.au/journal/2020/pandemic-printing-evaluation-novel-3d-printed-swab-detection-sars-cov-2.

Figure 6.3 3DMEDitech's nasal swab

Source: Medical Journal of Australia

Computer games teach kids social distancing

Perth-based software development company Sentient uses gaming technology to develops virtual worlds for training and education purposes. Sentient employs virtual reality training, 3D visualisations, process control and automation solutions for big resources companies. This allows staff to 'walk' around remote mining operations while being thousands of kilometres away.[140] But as the coronavirus pandemic hit, Sentient developers turned their minds to something entirely different: how to teach children how to keep their distance from people and to keep washing their hands.

Supported with funding from NERA, Sentient developed an educational game called the Social Distance Dash,[141] which can be played on a PC or mobile device. The premise is for the players to get a packet of toilet paper to their granny's house in the fastest time possible. Players are penalised for coming too close to people and awarded bonus time for collecting bottles of hand sanitiser.

Sentient Managing Director Doug Bester noted that when the pandemic struck, business stumbled. The project afforded his team the opportunity to work on something that would generate zero income:

> *"Our developers wanted to do something that could help. When it first hit everything, [business] sort of wobbled... I figured that we would be able to do the two weeks and it would be good for the team to be busy on something."*
>
> *Doug Bester, Sentient MD, quoted in the AFR*

Social distancing is a crucial tool in helping the Australia to contain the virus. Getting this message across to children is important. Even though Sentient's app is designed for children aged between 7 and 15 years old, adults can also learn about true social distancing. Doug Bester said:

> *"I found that while I was playing the game, it actually changed my behaviour, which I thought was fascinating. In terms of when I went for a walk, I found I knew what 1.5 metres was. I think our developers did an incredible job."*

Making and supplying 1,000 emergency hospital beds per week

Four Australian-owned and operated manufacturers teamed up with US Fortune 500 medical technology company Stryker South Pacific, to make emergency hospital beds in response to COVID-19. The AMGC helped coordinate the partnership across local supply chains using Australian manufacturers, A H Beard, AmTek Australia, Fallshaw Wheels & Castors, and Varley Group.[142]

Within six days of starting the project, Stryker in partnership with AMGC, mapped a local supply chain to adapt the design, create prototypes and begin production of the Emergency Relief Bed in Australia. The new beds are designed to provide surge capacity for hospitals during the COVID-19 pandemic.

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[140] Sentient (n.d.). *Social distance dash*. Accessed 17 June 2020: http://sencom.com.au/social_distance_dash_homepage/.

[141] Australian Financial Review (2020). *The computer game that teaches kids social distancing*. Accessed 17 June 2020: https://www.afr.com/technology/the-computer-game-that-teaches-kids-social-distancing-20200515-p54tek.

[142] Stryker (2020). *Australian manufacturers producing emergency hospital beds.* Accessed 17 June 2020 at https://www.stryker.com/au/en/about/news/2020/australian-manufacturers-producing-emergency-hospital-beds.html.

Department of Industry, Science, Energy and Resources (2020). *Making and supplying 1000 emergency hospital beds a week in the fight against COVID-1*, media release 30 April 2020. Accessed 17 June 2020 at https://www.industry.gov.au/news-media/covid-19-news/making-and-supplying-1000-emergency-hospital-beds-a-week-in-the-fight-against-covid-19.

The project is producing 1,000 Emergency relief Beds per week for Australia and the region. The product is designed for patients in respiratory distress and meets Australian Therapeutic Good Administration standards. The beds are similar to those used in temporary hospitals in New York.

> *"Every day we at Stryker are driven to make healthcare better for patients and caregivers. I'm very proud of this partnership with leading Australian manufacturers which has enabled Stryker to deliver on our mission through the Emergency Relief Beds".*
>
> *Stryker South Pacific's President Maurice Ben-Mayor*

This speed at which this project progressed from concept to design and production highlights the strength and adaptability of the local manufacturing sector. As the Minister for Industry, Science, Energy and Resources noted:[143]

> *"The fact that these beds can be manufactured from readily available components, shipped and stored as flat-packs and then assembled on-site with hand tools demonstrates the kind of ingenuity that is helping Australia respond effectively to the COVID-19 crisis".*
>
> *The Hon Karen Andrews MP*

[143] Hon Karen Andrews MP (2020). *Aussie manufacturers unite to produce emergency hospital beds*, media release 29 April 2020. Accessed 17 June 2020 at https://www.minister.industry.gov.au/ministers/karenandrews/media-releases/aussie-manufacturers-unite-produce-emergency-hospital-beds.

7 Findings and Recommendations

This Section provides an overall conclusion from the Evaluation. It also provides key findings or lessons relating to each evaluation theme set by the Department.

7.1 Overall conclusions

Overall, the Evaluation has identified ample evidence to suggest that the IGCI supports Australian industries to become more competitive, resilient and sustainable. The precept of using an industry-led approach to support economic sectors which demonstrate competitive, comparative, or strategic advantage, is sound and consistent with other top performing OECD nations, such as the UK, the Netherlands and Sweden. The IGCI empowers industries to formulate solutions (which best meet their unique needs) by focusing on the translational aspects of innovation and collaboration. This is aligned with good practice innovation policy design.

Feedback from more than 150 stakeholders suggests that the IGCI is valued and has significant potential to deliver long-term value. Stakeholder consultations took place prior to the announcement of the MMS.[144] The IGCI's potential will be realised only if the investments of yesterday are given time to mature. Moreover, it can only be realised if GCs are actively supported in achieving their goals and they competently execute their mandates. GCs are showing signs of delivering impact in the future (with some GCs showing greater impact potential than others). Stakeholders believe that there is a strong case for the Initiative to continue. They note that the GCs were asked to develop ten-year strategies. These strategies are just starting to yield promising results, a conclusion supported by the Department's analytical evidence.

However, improvements are required to ensure the IGCI's objectives are met and GCs deliver on their potential. Most GCs consider that the IGCI's performance and monitoring framework is unworkable. Its data collection framework has not been consistently adopted or followed by the GCs. The IGCI's governance model also requires improvement to help drive the longer-term performance and accountability of GCs. Some of these issues may be addressed through the recently announced funding extensions and proposed changes to reporting and governance.

7.2 Appropriateness findings

The Evaluation has found that the IGCI is appropriate and reflects modern practice in a number of OECD countries.

The Evaluation has considered the IGCI's original policy rationale and concludes that there is an ongoing need for policy intervention which supports industries to be more innovative, collaborative, commercial, export-focused, highly skilled, and ultimately more competitive, resilient, and sustainable. This need is even more evident as Australia recovers from COVID-19 and prepares for future disruptions. The Australian Government's commitment to industry-led policy was reinforced in the 2020-21 Federal Budget with the announcement of the MMS.

The Evaluation also considered the *flexibility* that the GCs were afforded to pursue Government's policy objectives in an industry-relevant and sector-specific way – which was a key design element of the IGCI. The GCs have, by and large, embraced this flexibility. GCs have implemented customised work programs, focused on meeting the current and future

[144] Stakeholder consultation was conducted from June to September 2020, with the surveys active between mid-July and mid-August 2020.

needs of their sectors. GCs have taken considerable time and care (some more than others) to ensure design choices reflect national and international research, and the views of industry stakeholders. They have also engaged in a process of ongoing review, which has led to adjustments in their priorities and plans (as required).

Consideration of the design choices taken by the GCs reveals that they have, in many ways, met the components of Dr Janssen's frameworks (see Chapter 3). A review of GC documents and feedback from stakeholders identifies many examples of GC design which reflect Dr Janssen's requirements for the IGCI to be open, change-focused, leadership-oriented, adaptable and outcome inclusive. While there are also some examples of new market formation or development within the GCs which look promising, it is too early to tell whether they are the start of a pattern of behaviour or one-off occurrences. For example, AMGC played a pivotal role in developing a marketplace and platform which facilitated commercial discussions between manufacturers (with potential capabilities) and the buyers of personal protective equipment (PPE) during the first COVID-19 national lockdown in 2020 (see Chapter 6). In the absence of AMGC, it is unlikely that a market for PPE would have formed and mobilised in such a rapid way. The evidence and arguments supporting this conclusion are mapped in Chapter 6 and the GC assessments in a separate report.

However, this design flexibility has come at a cost. Some GCs have chosen to progress objectives that are somewhat different to those of the IGCI. Some GCs have also changed/evolved objectives over the period of their operation.

Differences in objectives have led to GCs pursuing a range of different activities. These differences also make it difficult to aggregate the actions of GCs and arrive at a definitive conclusion about overall IGCI impact. There is some confusion amongst stakeholders as to where the boundaries of GCs begin and end, especially with regard to other portfolio programs under the ISA remit. There is value in clarifying the pathways or relationships between the IGCI and other programs using the TRLs and CRI (see Section 3.3.3).

In 2020, it is difficult to develop a clear line of sight between the IGCI' objectives and those pursued by some GCs through their activities. The Program Logics, developed by the GCs and the Department in the past 1-2 years, help improve this line of sight to some extent. However, it is difficult to look across GC activities and easily link activities to IGCI objectives. Even where activities have been similar in nature (i.e. funded research projects) these activities have pursued different objectives or Knowledge Priorities and it is difficult to see the alignment of some GC projects to an IGCI objective. The Department will need to be cognisant of these implications as it plans for any future evaluation.

To address this issue, the GCs need to be asked to develop more realistic Performance Measurement Frameworks and reflect these in their annual Business Plans where they outline how they will measure outcomes and impacts of the activities proposed. In part, these challenges may be addressed under the funding extensions provided through the MMS. Each GC will be asked to realign and refocus their activities to support the implementation of the MMS in the immediate term and contribute to outcomes aligned with the National Manufacturing Priorities. The funding extensions provide an opportunity for the GCs and the Department to pursue regular and more meaningful reporting.

7.3 Efficiency findings

The Evaluation considered the **efficiency** of the IGCI's administration, its delivery timetables, its monitoring and evaluation framework, and intra and inter-agency cooperation. The evidence and arguments supporting the conclusions below are mapped in Chapter 4.

Some inefficiencies arose in the early stages due to the novel industry-led approach. However, the efficiency of the GCs appears to have strengthened over time. There is room for improvement in terms of inter-agency cooperation, monitoring and evaluation.

The IGCI's delivery has been slower than originally planned. Some GCs took up to two years to finalise their strategies and plans, and to establish their operational functions. Some GCs also experienced leadership issues and staff turnover, which 'slow-tracked' their establishment phase. It is clear from the consultations that a strong/experienced Managing Director and Board Chair (working hand-in-glove together) are minimum requirements for a GC seeking to become fully operational in under one year.

GCs receive relatively similar levels of funding from Government (somewhere between $40-43 million). This funding is mostly used for operational expenditure and to fund projects. GCs have shown variable ability to generate funding from industry, a key requirement of the IGCI and a core rationale of the original program design. This in part reflects different industry sector circumstances, yet is essential if GCs continue to be required to move towards self-sufficiency.

GCs have also had little success in attracting operational funding from other government programs. ACIL Allen has not been able to identify any current Australian Government programs that the GCs, in their own right and in their current form, are eligible to seek operational funding from. Although the GCs can support their stakeholders to apply for funding, this funding does not flow to the GCs themselves. This situation contrasts with the UK's Catapult Centres and the Netherlands' Topsectors, both of which can access other programs that more than double their core government funding. Further, the funding provided to the Catapults has enabled them to invest in facilities which generate revenue from industry clients.

Expenditure on administration for individual GCs is less transparent and not easily attributable to activities. Some of the GC's operational and administrative expenses appear to be high, which in part reflects the fact that many GC functions (such as event management, education and training) are developed, driven and executed internally. However, it is not possible to attribute administration and management costs to the activities undertaken. To attribute staff time to activities would require the GCs to record the time involved.

Challenges with the roles and responsibilities of government in an industry-led initiative persist in the administration of the IGCI. Implementation of the IGCI is overseen by multiple players, the Department (as the funder), the independent GCAC and GC Boards. The GCs must also be responsive to industry and other collaborators, and as such, serve many masters. This adds to the GC's administrative complexity and reporting requirements.

While the GCs comply with the administrative requirements outlined in the Program Guidelines (namely, reporting requirements resulting in the achievement of payment milestones), it is not clear whether the Department is meeting its responsibilities, under the Program Guidelines, to manage GC performance. Insights obtained from some GCs indicate that the Department does little to question or redirect GC activities, strategic direction, or performance. No GC has been de-funded, which is in contrast to the management decisions taken by Innovate UK for the Catapults.[145]

The Program Guidelines do not provide specific direction as to how the GCs should go about establishing the performance measures required to effectively assess outcomes. Both the Post-commencement Evaluation and Nous Group Performance Assessment highlighted performance measurement as a significant challenge. While performance measurement is complicated by a range of external factors (e.g. the long-term approaches of each GC, the lag time to impact, and the intangible benefits delivered by the GCs), as well as internal factors (e.g. implementing the IGCI and GCs without a Program Logic or data collection strategy, allowing the GCs the flexibility to undertake different work programs and to develop different objectives and performance measures) more consistency is required in this area of the IGCI's administration.

The Department should make further funding conditional on the GCs developing Specific, Measurable, Achievable, Realistic, and Timely (SMART) KPIs that are focused on the outcomes and impact of the GCs, and relate directly to the IGCI objectives. Further, there are cases of some GCs reporting outcomes in ways that could be replicated by other GCs. This would build consistency across the GCs and support the assessment of the IGCI. The funding extensions under the MMS provide an opportunity for the GCs and the Department to pursue regular and more meaningful reporting.

Considerable effort has been made to retrospectively develop the overarching (Department) and individual (Department and GCs) Program Logics and Performance Frameworks. The delay in developing these documents has implications for the IGCI. Further, the GC's Program Logics and Performance Frameworks are inconsistent with each other and with those of the overarching IGCI, which complicates an assessment of the IGCI. While the Performance Frameworks were not intended to support the Evaluation, only two GCs are clearly collecting data against their Performance Frameworks. There appears to be no current requirement for the GCs to implement their Performance Framework and, across most GCs, there appears to be limited motivation to do so.

[145] Ernst and Young (2017). Op. cit.

The data supplied by most of GCs for the Evaluation contains significant gaps, with GC reporting typically focused on inputs, activities and outputs. These data will not support a future assessment of impact or attribution.

The GCs were tasked with collaborating across existing initiatives and agencies to improve the IGCI's efficiency, leverage resources and build scale. The GCs have engaged broadly across industry bodies and associations, research organisations/universities, and federal and state governments. Cross-GC collaboration has come more recently in response to the COVID-19 pandemic. Insights from stakeholder consultations reveal some potential for overlap between funding programs such as CRCs, CRC-Ps and ARC grants and the research funding offered by GCs. Further, CSIRO appears not to have been engaged as effectively as originally intended. GCs need to engage with stakeholders, including CSIRO, relevant to their sector Knowledge Priorities and work plans.

There is value in clarifying the pathways or relationships between the IGCI and other programs using the TRLs and CRI (see Section 3.3.3).

7.4 Effectiveness findings

It was a requirement of the Evaluation to consider the IGCI's initial **effectiveness**, including its achievements, its diversity of participation, its outcomes and counterfactual considerations. The evidence and arguments supporting the conclusions below are detailed in Chapters 5 and 6.

To the extent that the GCs have been able to support projects and organisations, the GCs have been very effective.

7.4.1 Evidence of impact

The Evaluation is predominantly focused on a qualitative assessment of impact, however the quantitative firm-level analysis conducted by the Department also reveals some interesting early insights about the IGCI. This analysis identifies a range of anticipated outcomes and impacts, against both the IGCI objectives, and the TIS. Attributing these outcomes to the GCs is complex due to the many players and externalities that influence sector-wide growth over multiple years.

The evidence collected suggests that GC's are addressing the four IGCI objectives. However, there is a clear emphasis on conducting activities that address Objective 1, increasing collaboration and commercialisation. All GCs are delivering medium/high impact against this objective, with many of the impacts prospective. This may reflect the need in each sector to develop a cohesive ecosystem combined with the probability that collaborative projects can more readily be executed and deliver results in a shorter timeframe. Achievements against Objectives 2 (international opportunities and market access), and 3 (management and workforce skills) are more variable, with some promising signs.

The extent of a GC's impact against Objectives 1-3 is constrained by the personal networks and the expertise of GC staff, and (of course) their funding levels. Some GC staff have exceptional networks and are adept at finding ways to engage organisations in their target group. However, the data provided by GCs on this engagement is variable, making it difficult to draw overall conclusions. For example, the data do not provide answers to important questions such as: Are businesses or, alternatively research organisations too dominant? Are some subsectors excluded from setting directions? Are stakeholders following a new agenda because of GCs? Are growth pathways truly future proof? Is information retrieval and learning resulting in strategic adaptations? These questions could be answered in a future survey of participants, which builds on the survey developed by ACIL Allen (which was deliberately designed to be short and easy to respond to because of COVID-19) and could be rolled out across all GCs on a regular basis.

The GCs have made less progress towards Objective 4, regulatory reform. Early research conducted by some GCs consider that this is not a priority for most sectors and the majority of stakeholders noted that the GCs lack the levers to address regulatory issues, although they can perform an awareness and advocacy role. That said, some GCs are progressing targeted regulatory issues, largely around streamlining national and international standards, modelling better safety auditing and developing standards for new technologies.

ACIL Allen's assessment of achievements against Dr Janssen's TIS framework[146] considered each of the elements of the TIS, the GC inputs and the effects. Across all GCs, there is evidence that GCs have addressed all TIS elements. The relative need and importance of each element generally correlates with the level of effort the GCs have made. The GCs are directing funding effort across all TIS elements, delivering a holistic response to the identified need. As a result of these inputs, the GCs have achieved solid results across all TIS elements, even if some of these results are prospective. In general, low/medium inputs and effects have been generated for 'guiding direction of search', however this could result from the paucity of information on impact for this TIS element. In contrast, the need for 'knowledge exchange' and the resulting inputs and effects have been substantial. This links closely with the GCs progress on Objective 1, increasing collaboration and commercialisation. While it is too soon to understand the magnitude of the changes that have occurred, the GCs have aimed high and the tentative magnitude appears large.

The GCs were broadly tasked with driving coordination and collaboration across a range of stakeholder types, some of which are common across the GCs; others are sector specific. While significant data limitations exist on GC-interactions and participants, some trends are emerging. Project Funding has largely been distributed in four states: WA (largely METS Ignited and NERA), QLD (largely AMGC and FIAL), NSW (largely AustCyber) and Victoria (largely MTPConnect). This reflects sector dynamics and priority locations. AMGC and FIAL have the most geographically diverse Project Fund participants. Most participants are involved in the services sectors and many are SMEs. It is likely that the outcomes will be concentrated where the majority of resources have been invested.

One originally intended measure of GC success is the ability to become self-sustaining. Consensus across the documents examined, international comparators and the stakeholder discussions (especially with senior level stakeholders who have a strong understanding of Australia's innovation system) indicate that this is not realistic, particularly in the foreseeable future. If the GCs are to continue, ongoing government funding and support will be required. However, while the Australian Government has extended funding under the MMS, ACIL Allen understands that the GCs will be asked to submit a plan to the Department in 2021-22, outlining how they will transition to a sustainable private sector model.

7.4.2 Other benefits

The Evaluation has not been able to qualitatively measure the spillover benefits to non-GC businesses. The quantification of these benefits is something that may be possible in the future, using CGE modelling.

Australia has recently faced major challenges — severe drought, extensive bushfires and the COVID-19 pandemic. The GCs have responded in two main ways. They have implemented various measures to help their stakeholders survive, including emergency funding programs, networking and information support. Secondly, they have contributed to cross-sectoral responses to COVID-19 through government taskforces. The achievements from these responses are documented in Chapter 6.

7.4.3 The counterfactual

In the absence of the IGCI, Australia would be missing opportunities to build areas of the economy which are supported by various strengths and offer potentially valuable opportunities. This is a strongly held view by most stakeholders consulted who are familiar with the GCs. It is also consistent with the survey results from more than 900 respondents who had engaged with the GCs since their inception. For more than two decades, other OECD countries (and some outside the OECD) have recognised the legitimacy of the approach embodied in the IGCI. Countries such as the USA, Canada, the UK, Sweden, the Netherlands and others have made large investments (some significantly larger than Australia's IGCI) and are reaping returns. These outcomes have been documented in OECD reports.[147]

[146] Janssen, M. (2019). Op. cit. See also Appendix B.

[147] OECD (2017). *STI Scoreboard, OECD STI Outlook 2018*, Innovation Reviews of the Netherlands 2014 and Sweden 2016.

The COVID-19 experience shows that Australia cannot rely on education and tourism to generate export revenues. Furthermore, Australia cannot rely on foreign suppliers of critical goods such as ventilators and virus test kits. More significantly, COVID-19 has demonstrated how easily supply chains critical to the economy can be disrupted. If Australia is to succeed in the 21st century it is essential that a 21st century approach be adopted to building and strengthening the economy. The IGCI is helping to make this happen.

Australia's Gross Expenditure on R&D as a percentage of GDP has been falling since 2009. Business investment in R&D is well below the OECD average. Australia's small domestic market and geography present particular challenges in establishing and maintaining internationally competitive businesses, especially given the relative lack of home-grown multinationals and the predominance of SMEs. Even the competitive mining and agricultural sectors need to work hard to maintain their position in international markets. Without measures such as the IGCI, Australia risks not only falling behind its competitors but failing to create the capabilities and new businesses which will be essential to maintaining Australia's standard of living in the 21st century.

7.5 Lessons learned and looking ahead

The MMS has reset the landscape for manufacturing policy, both in terms of ambition and scale. To identify opportunities to support the MMS, the Department has been asked to review existing programs, including the IGCI, and each of the GC's have been asked to review their activities. GCs should be in a position to contribute to the MMS given that four of the GCs directly relate to counterpart National Manufacturing Priorities and two cross cutting GC's (AMGC and AustCyber) contribute to outcomes across all National Manufacturing Priorities. The realignment also provides an opportunity for several of the recommendations of the Evaluation to be taken up in a holistic way.

The future of the IGCI and GC's is a matter for government and outside the terms of reference of the Evaluation. However, the review of program alignment against new priorities would seem to be a timely opportunity for thought to be given to the next stage of the IGCI. In this context there are a number of observations, or lessons learned, which may be relevant.

First, a flexible, industry-led program can be a powerful tool and clearly has a place within the innovation ecosystem. However, the IGCI's funding envelope is small relative to that of comparable international programs such as the UK's Catapult Program and there is now the MMS with its larger funding opportunities. If they are to maintain relevancy in the new environment, it may be opportune for the existing GC's to reframe their value offering drawing on their networks and knowledge/people/project asset base and focus on investments which will deliver the greatest comparative and competitive advantages to the sectors they operate in.

Second, achieving real progress and sector-wide change takes time. While the GCs have had around five years to build momentum, credibility and trust, this has been slower than anticipated. Providing further opportunity for the GCs to deliver on their strategies, which have a ten-year planning horizon, will enable longer term benefits to be realised.

Third, a flexible industry-led program like the IGCI must plan for the benefits it will deliver, and design its evaluation requirements accordingly. Better utilisation of Program Logics, data collection frameworks and KPIs by the GC's will assist in managing performance and identifying beneficial impacts. The funding extensions provide an opportunity for the GCs and the Department to pursue regular and more meaningful reporting.

Fourth, the IGCI must have effective governance and support to drive its longer-term direction and/or coordination with other government programs. The IGCI's governance arrangements should ensure active management of GC performance by requiring performance management in future funding agreements, to build confidence in the IGCI and deliver maximum value from it. As part of the announcement of the MMS, the reinvigorated Industry, Innovation and Science Australia (IISA) has been established to inform and guide policy on industry, science and research and advocate and champion Australia's innovation, science and research system. This presents an opportunity to improve the IGCI's governance arrangements.

Lastly, many stakeholders consulted (including those with innovation system leadership responsibilities) believe that additional funding is required to help GCs scale, reach a diverse audience and achieve impact towards the IGCI objectives. The MMS through it various funding streams is expected to create opportunities for driving scale in manufacturing in a way that the GC's, at current funding levels, cannot.

The intention is for the GC's to transition from IGCI funding to alternative sources. In ACIL Allen's view, noting that none of the international comparators operate on purely private sector funding, it is unlikely the GCs will become self-sustaining. It may be possible that a public/private funding model will provide a transitional platform.

7.6 Recommendations

The Evaluation makes eight recommendations. The recommendations seek to enhance the design arrangements, processes, impacts and evaluation readiness of the IGCI over time. The recommendations are offered with a distinct logic, which reflects the ambitious scope of the IGCI (i.e. to achieve lasting sectoral change), the prize for delivering against that scope (i.e. improved productivity and competitiveness), and the resource and capacity limitations that are a reality for all Government programs. These recommendations are based on a presumption of program continuance largely in its current form.

It is critical in a resource constrained environment that the IGCI and GCs are focused on actions and investments that deliver the most value to stakeholders. Recommendations 1-3 are designed to provide the means by which the IGCI and GCs can achieve greater focus in areas that will deliver the most benefit. By focus, we refer to the need to focus on actions/investments that are more appropriately aligned with a GC's 'span of control' and the need for clear boundaries between the IGCI and other Government programs. It is important that these boundaries are clear so that a unique proposition can be consistently articulated to GC target firms, and other GC stakeholders and collaborators.

Once the IGCI is focused, it is then important to consider the arrangements which will help to drive the performance and accountability of GCs over the long term. To this end, recommendations 4-7 seek to enhance the IGC's governance model, performance framework and reporting.

Finally, there are some steps that Government can take to improve the IGCI's evaluation readiness prior to the next scheduled evaluation in 2023-24. These steps include addressing many of the GC data gaps identified in the Evaluation as well as refining and then re-running the GC stakeholder survey developed for this project on a regular basis. They are the focus of Recommendation 8.

7.6.1 Objectives, strategies and boundaries

Recommendation 1: Ensure all GC objectives align with the IGCI objectives

Noting that the GCs have been asked to realign and refocus their activities to support delivery of the MMS and contribute to outcomes aligned with the National Manufacturing Priorities, the IGCI objectives are sufficiently broad to enable the GCs the flexibility to do so and address the opportunities and barriers to growth in each sector. All GC objectives should be clearly aligned with an IGCI objective and aim to maximise value to the economy. GC objectives should be clearly stated, documented and consistently communicated to ensure a measurable, long-term strategic focus that minimises the impact of short-term policy changes.

Recommendation 2: Ensure GC's are focused on supporting businesses through TRLs stages 4-7 and CRI 1

GCs should be focused on developing strategies and delivering activities that play to their unique position within the innovation/commercialisation ecosystem. There should be clear boundaries between the IGCI and other Government programs (which typically have greater resources and capacity to achieve outcomes). To this end, it is recommended that the GCs are asked to be guided by technology readiness levels (TRLs) and the commercial readiness index (CRI) to focus their activities and business support. GCs should focus mainly on supporting activities at TRLs 4-7 and CRI 1.

Recommendation 3: Clarify the boundaries between the IGCI and IISA's other industry-based innovation and commercialisation programs

The IGCI was implemented outside the then ISA's remit of complementary innovation and commercialisation programs. The boundaries between the programs remain unclear to many stakeholders consulted. Defining the IGCI's role in relation to innovation and commercialisation programs through program realignment will clarify its focus in the new policy landscape. There is value in clarifying the pathways or relationships between the IGCI and other programs using the TRLs and CRI. It

is important that all programs which provide innovation and commercialisation services to firms have clear boundaries and have processes in place which channel participants to, and from GCs on a systematic basis.

The establishment of the IISA also presents an opportunity to improve the IGCI's governance arrangements.

7.6.2 Governance and performance management

Recommendation 4: Strengthen IGCI governance/oversight

Programs of the IGCI's scale, size, complexity and importance require dedicated senior official support and active oversight by a strong governance committee. Stakeholders believe that there is a need for more effective governance of the IGCI, with greater oversight of GC direction setting, performance monitoring and risk management.

The announcement of the MMS and funding extension under the 2020-21 Federal Budget provide the opportunity for the Department to improve the IGCI's governance arrangements under the IISA.

Recommendation 5: Improve program KPIs

It has been evident from the Evaluation that the current KPIs do not provide information which demonstrates the overall performance of the IGCI or individual GCs. Following the announcement of the MMS the GC's have been asked to report on specific KPIs and this presents an opportunity for the IGCI develop a smaller number of meaningful KPIs which are based on the Specific, Measurable, Achievable, Realistic, and Timely (SMART) criteria and other best practices in the field of innovation, drawing on indicators used in the UK Catapults Performance Framework.

The core data sets that underpin KPI measurement need to include details of companies assisted (e.g. ABN, contact details) and the nature of the assistance provided. This will allow the use of BLADE to see how these companies have performed by comparison with sectoral averages or with businesses having similar characteristics. Outcome data to be collected by GCs needs to include funds leveraged (whether for R&D or other activities), funds raised by assisted start-ups and fast-growing SMEs, numbers and value of collaborations, jobs created, patents and licences, outcomes of training sessions provided, new products and services introduced. With this information, other measures such as increases in turnover and exports can be derived using BLADE.

Recommendation 6: Embed improved KPIs within the operations of GCs

GCs should embed KPI performance management into their organisations, where this is not already occurring. This will involve clearly, transparently and consistently communicating strategy/priorities and related KPIs. There is a need for a clear focus on performance orientated KPIs as opposed to activity indicators (which are what are currently being reported by most GCs). It also involves assigning clear accountability for KPIs and reviewing their progress through regular performance monitoring. The GCs should be required to include a section in their annual Business Plans setting out how they intend to measure the outcomes and impacts of the activities they are planning to undertake in that year.

Recommendation 7: Improve the management of GC performance assessed against KPIs

Further to Recommendation 3, it is important that any poor or unsatisfactory GC performance is appropriately managed. The extension of funding and reinvigorated IISA provide the opportunity to require performance management according to KPIs and link performance with funding.

Three criteria for managing poor GC performance are offered under this recommendation.

Criterion 1: managing poor or ineffective leadership. Where a GC has poor or ineffective leadership (due to poor board performance, a high rate of leadership turnover, etc) which impacts its ability to set an appropriate direction or execute it in a timely way, then the IGCI's governance/management arrangements should resolve these issues.

Criterion 2: ensuring alignment with IGCI's objectives. GCs in receipt of Government funding must demonstrate strong alignment between their actions/investments and each IGCI objective. Where alignment is weak, and Government money has been expended, then GCs must provide an adequate explanation for their actions and the IGCI's governance/management arrangements must have the ability to take remedial action to ensure strong alignment in the future.

Criterion 3: performance reporting and business plans. Based on recommendations 5 and 6, the IGCI's governance/management arrangements must include reviews of GC KPIs and business plans so that any unsatisfactory performance or progress can be addressed.

7.6.3 Evaluation readiness

Recommendation 8: Improve the IGCI's evaluation readiness

Ideally the IGCI should be evaluation ready, but it is not. Key data are missing across the GCs. There is limited appetite amongst some GCs to address data issues and to become more evaluation ready in the future. Considerable effort is required to improve the future evaluation readiness of the IGCI (i.e. improved data collection and performance measurement, with a focus on quantifying impact).

This recommendation requires the Department and GCs to address all the data issues and gaps (or as many as reasonable within the timeframe) identified in this report and to improve the consistency and completeness of existing data sets. In some instances, it may require GCs to backward map data into the frameworks and categories required to measure the impact of their various activities, as suggested by Dr Janssen.

This recommendation includes the development of an annual survey of GC participants (which builds on and extends the survey developed by ACIL Allen) to provide increased consistency and to understand the impacts of GC activities against the four IGCI objectives.

Under the funding extensions strengthened GC and Departmental reporting can aim to drive improved oversight and accountability. ACIL Allen believes this will support improved evaluation readiness.

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Appendices

Terms of Reference

A

A.1 Initial Impact Evaluation Terms of Reference

The Department of Industry, Science, Energy and Resources (the Department) will commission major parts of an Initial Impact Evaluation of the Industry Growth Centres Initiative between November 2019 and July 2020. Some evaluation work will also be undertaken by the department. The Evaluation as a whole will consist of two stages:

- **Stage 1**: Development of a qualitative Evaluation methodology, undertaken by an external expert, and
- **Stage 2**: Initial Impact Evaluation, including
  - a. Qualitative analysis using methodology developed at Stage 1, conducted by a consultant and
  - b. Quantitative firm-level analysis conducted by the department.

In addition, a quantitative spillover analysis may be undertaken as a separate, complementary project to the Evaluation. This will be decided once the quantitative firm-level analysis and qualitative analysis has been completed. The spillover analysis will assess the Growth Centres' impact at the sectoral as well as economy-wide level.

The Evaluation will be managed by the Department Evaluation Unit, with additional support provided by the Insights and Evaluation Branch and the Growth Centres Policy Section.

A.2 Evaluation scope

The Initial Impact Evaluation will examine the performance of the Industry Growth Centres Initiative against the criteria of:

- **Appropriateness** of the Initiative's design, including the rationale and alignment with strategic objectives.
- **Efficiency**, including management of the Initiative and its reach (sectoral, temporal etc.).
- **Effectiveness**, including performance measurement, progress towards the intended outcomes, and obstacles encountered.

It is expected that the Evaluation will examine the individual Growth Centres, as well as the initiative as a whole.

Evaluation Questions, Assessment Frameworks and Data Sources

B

B.1 Overview of Dr Janssen's Assessment Framework

B.1.1 Logical Framework Analysis

Logical Framework Analysis (LFA) allows for the assessment of consistency between how the IGCI was intended to operate and how the GCs have defined their priorities and activities. This involves mapping the GCs Program Logics to determine the extent to which the GC strategies align with the original IGCI policy objectives and logical framework.

B.1.2 Coordination Structure Assessment

The Coordination Structure Assessment (CSA) examines the coordination structures (GC practices, structures, procedures and protocols) for gathering and structuring relevant information to inform GC's work. For example, how the GCs organise their responsibilities and activities and the design principles. This considers eight design principles for successful transformative policies: information retrieval, openness, focus on change, leadership, broad support, outcome inclusivity, accountability, and adaptiveness.[148]

B.1.3 Impact assessment: Technological Innovation System

The Technological Innovation System (TIS) element of Dr Janssen's methodology investigates IGCI functions, including the extent to which the GCs have been building a TIS, whether the measures taken by the individual GCs were needed, what impact they had on the sector and the efficiency of this impact.

This element of the methodology focuses on seven key functions: entrepreneurial experimentation, knowledge development, knowledge exchange, guiding direction of search, market formation, resource mobilisation, and legitimation/counteracting resistance.

ACIL Allen has sought to develop tables that combine qualitative and quantitative data for each of the GCs, leading to an overall assessment of the IGCI.

B.1.4 Impact assessment: knowledge production and economic structure changes

This element of the methodology seeks to apply attribution-based analyses to relevant GC functions, such as knowledge development, R&D and innovation, to identify sectoral impacts for each GC, such as innovation and growth and the production and export of economic activities for Australia. This includes the extent to the GCs have effected change in:

— the ways in which knowledge is being developed, shared and commercialised
— the strategies of organisations which have participated in GCs
— cooperation and collaboration between GC participant firms, consortia formation and collaboration outside the sector
— approaches to training personnel to meet skills shortages

[148] Janssen, M. (2019). Op. cit., page15.

— successful diversification strategies

— identification of new markets and moves to service them.

— Performance Analysis

The performance analysis component of the methodology is designed to measure the IGCI's impacts at the firm and macroeconomic levels. This includes assessment of performance indicators, macro / industry level changes, analysis of firm-level impacts. Dr Janssen proposed utilising Australian Bureau of Statistics (ABS) and Business Longitudinal Analysis Data Environment (BLADE) data for these components, as well as information or data from the Department. The key findings from the Department's BLADE are presented in Sections 5.4 and 6.1.[149]

B.2 Alignment between Evaluation and Assessment Frameworks

The Department had outlined a series of Evaluation Questions it was seeking to have addressed from the Initial Impact Evaluation. These questions were mapped against the Assessment Framework in Table B.1 to show how an overall framework has been developed for the Evaluation.

Table B.1 Evaluation questions

Element	Sub-element	Evaluation Questions	Assessment Framework		
			LFA	CSA	Impact
Appropriateness	Original rationale for the program	What is the nature, magnitude and distribution of the market failure, problem or issue which the initiative is trying to address?	✓		
	Original rationale for government intervention	Was it appropriate for the Australian Government to intervene?	✓		
	Program design	Did the initiative design address the need?	✓	✓	
		How effective is the alignment with other programs?	✓	✓	
		Is this initiative the most appropriate mechanism to address the problems or issues?	✓	✓	
		Did the initiative have clear and consistent objectives?	✓	✓	
		Have changes or improvements been made to the initiative since 2016 (when the Post-Commencement Evaluation was finalised)? How effective have they been?	✓	✓	
		How do the design and outcomes of the Initiative compare to its international counterparts?	✓	✓	
	Persistency of alignment with strategic objectives	Is there still a need for the initiative?	✓	✓	
		Is government intervention still appropriate?	✓	✓	
		Does the initiative remain consistent with the Australian Government's strategic policy objectives and priorities?	✓	✓	
Efficiency	Administration	Were initiative delivery timetables realistic? Were there delays? If so, what actions were taken?		✓	
		Were there any significant administrative constraints and costs?		✓	
		Did the financial management provide a transparent, accurate and reliable view of how funds have been allocated and used?		✓	

[149] Office of the Chief Economist (2020). Op. cit.

Element	Sub-element	Evaluation Questions	Assessment Framework		
			LFA	CSA	Impact
		How could the initiative's administration have been more efficient?		✓	
	Monitoring and Evaluation / performance measurement	Are the KPIs appropriate and related to the initiative's objectives (at the individual GC and initiative-wide level)? Does the initiative have sound data collection methodologies?	✓		✓
		Is the Initiative's performance assessment framework being implemented, including the collection of necessary data?		✓	
	Inter-agency cooperation	Are the involved agencies able to work effectively together?		✓	
Effectiveness	What is achieved?	Is the initiative achieving its intended outcomes?		✓	✓
	How much is achieved?	What is the magnitude of the changes that occurred?	✓		✓
		Do the outcomes meet the targets, as highlighted in Sector Competitiveness Plans?	✓		✓
	Who is affected? / participation	How well do the initiatives' participants match the intended target group and is the reach sufficient to realise the required scale of change?		✓	✓
		Are there any groups negatively affected by the initiative?		✓	✓
		How many businesses/what proportion of businesses in each sector are reached?		✓	✓
		What is the breakdown of locations of businesses reached? E.g. regional, capital cities?		✓	✓
	Where are the outcomes concentrated?	Does the actual distribution of the outcomes differ from that which was intended?			✓
	How / why the outcomes are achieved?	What are the main factors contributing to the outcomes?		✓	
		Are there any unintended consequences?		✓	
	Attribution of Outcomes: counterfactual	What would have been the situation if the initiative had not been conducted?			✓
Lessons	Lessons learned	What, if any, lessons can be drawn from the initiative to improve the efficiency or effectiveness of this initiative and future initiatives or programs?		✓	

Source: ACIL Allen Consulting 2020 RFQ Attachment 3 - Methodology

B.3 Consultations

A total of 149 stakeholders were consulted for the Evaluation. This included:

- Department Officials (four stakeholders)
- Growth Centres Advisory Committee (four stakeholders)
- GC CEOs (six stakeholders)
- GC Directors (22 stakeholders)
- GC participants (34 stakeholders)

- Non-participants (23 stakeholders)
- Officials from other Departments/Agencies (ten stakeholders)
- State Government officials (six stakeholders)
- Academies (six stakeholders)
- Other IGCI stakeholders (five stakeholders)
- Independent experts (six stakeholders)
- Related industry associations (23 stakeholders).

B.4 Survey distribution and analysis

Two surveys were conducted: one of GC participants, one of "non-participants" (business that appeared to be in GC sectors but had not been listed by the GCs as participants).

The survey of GC participants addressed the respondent's engagement with their GC, their perspectives on the IGCI objectives and the relevant GC's performance against these objectives, the usefulness of the GC activities, the outcomes the GC has supported their organisation to achieve and the role of the GC in the sector.

The survey of non-participants addressed the reasons why the respondent had not participated in the relevant GC, their perspectives on the IGCI objectives and on the relevant GC's performance, the perceived impact of the GC and the role of government in the IGCI.

The two surveys were both designed and hosted using Web Survey Creator®. The respondents were advised that the survey was anonymous, and that de-identified information would be stored on Australian-based servers.

Non-participants

Non-participants were identified by the Department for a random sample of 1,485 EP recipients (from 2016-17 to 2019-20), who had not been involved in any GCs (based on data provided to the Department from GC CRMs). They were invited to complete the non-participant survey. From the survey results it was found that approximately 33 per cent of the respondents (56 of 170) had been involved in some way with a GCs, indicating the GC's CRMs were incomplete.

GC participants

ACIL Allen worked with the GCs to coordinate the survey distribution. The GCs sent survey links and reminders to their participants as detailed in Table B.2. The survey was closed on 10 August 2020. The survey was kept short and simple to make it easier for participants to complete.

The GCs invested considerable effort to encourage their participants to engage with the survey. However, it is likely that the survey response rate was impacted by the COVID-19 pandemic. GCs reported that their participants were significantly impacted by COVID-19 and the ensuing economic downturn. The response rate was lower than might normally be expected. It is possible that the sample over-represents the most highly engaged GC participants. These participants may have been more likely to return a positive response. The survey respondents were asked to comment on longer-term experiences with the GCs. The survey design aimed to limit the extent to which COVID-19 influenced the nature of the responses.

Table B.2 GC participant distribution details

GC	Distribution approach	Date	Reminder approach
AMGC	Survey sent to approx. 300 highly engaged stakeholders. This did not reach the broader network of 2,500 companies that are registered with the COVID Manufacturer Response Register. AMGC did not ask the stakeholders to distribute the survey further.	14 July	Email reminders

GC	Distribution approach	Date	Reminder approach
AustCyber	Survey sent to approximately 138 stakeholders with whom they have had meaningful engagement with. They survey was emailed from Michelle Price CEO's email account.	17 July	State/Territory Node telephoned companies individually. In addition to the initial request, four follow up emails were sent and another 46 telephone calls were made to encourage responses. These were made from central and state/territory Node Managers.
FIAL	Emails sent to: – Four FIAL supported clusters – to complete and to distribute to relevant companies in their networks – 20 Black Summer Innovation Fund recipients – 52 Project Fund recipients – Posted on Mirjana Prica's LinkedIn profile – Monthly news bulletin database (approximately 7,000 people in the CRM).	14 July	Electronic Direct Mail (EDM) dedicated to the survey was distributed across the FIAL CRM. Cluster partners were asked to distribute the survey among their networks and Australian Institute of Food Science and Technology to distribute across their database. The FIAL Innovations and Markets teams are reminding and encouraging stakeholders to complete the survey during each phone call/interaction. Another post on Mirjana Prica's LinkedIn profile encouraging people to complete the survey.
METS Ignited	– 287 participants in METS Ignited activities – 14 program delivery partners	14 July	Email reminders
MTPConnect	– Direct Mail to 458 people on survey distribution list – Email sent to 90 stakeholders	14 July	– Email sent to 457 stakeholders on the original EDM list – Included in the MTPConnect newsletter sent to 2,995 subscribers on the full Master List – Second EDM reminder sent to 453 stakeholders on same list – Email reminder - sent to 84 people
NERA	Distributed to 1,389 stakeholders through EDM (via Campaign Monitor).	15 July	Individual stakeholders were assigned to the most relevant NERA contact. The NERA team send out personalised reminder emails to their list of stakeholders.

Source: ACIL Allen Consulting 2020

Of the 30 survey questions, one was mandatory, asking respondents to identify which GC they had been involved with. The respondents were subsequently directed to the knowledge priorities for that GC. The remaining questions were consistent across the GCs and were optional (seven of which were free-text responses). The response numbers are detailed in Table B.3.

Table B.3 Response numbers for the GC survey respondents

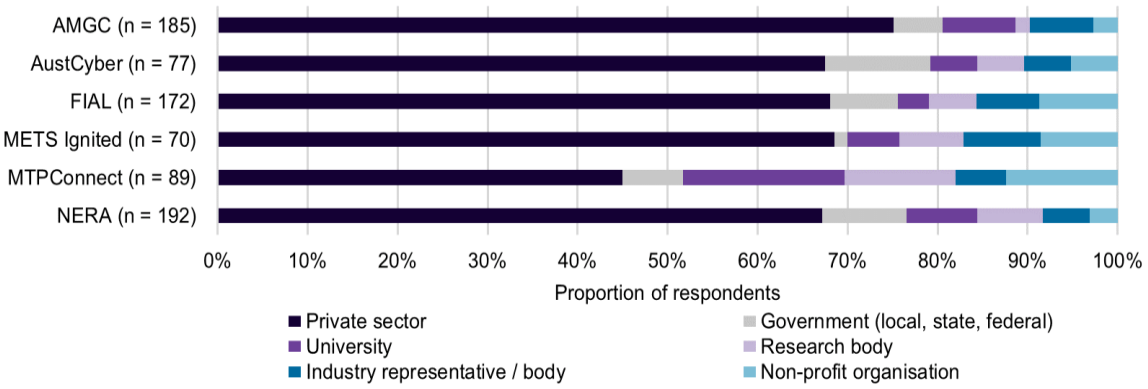
	Complete	Partial	Total	Proportion of total IGCI responses
FIAL	130	43	173	22%
AMGC	164	22	186	24%
METS Ignited	59	11	70	9%
MTPConnect	70	20	90	11%
NERA	151	41	192	24%
AustCyber	66	11	77	10%
Total	**640**	**148**	**788**	**100%**

Source: Survey of GC participants

GC participant demographics

Figure B.1 shows the distribution of GC survey respondents across business / organisation types. Most of the respondents were from the private sector. MTPConnect had the fewest responses from the private sector, with more university respondents than other GCs.

Figure B.1 Proportion of GC survey respondents by business / organisation characterisation

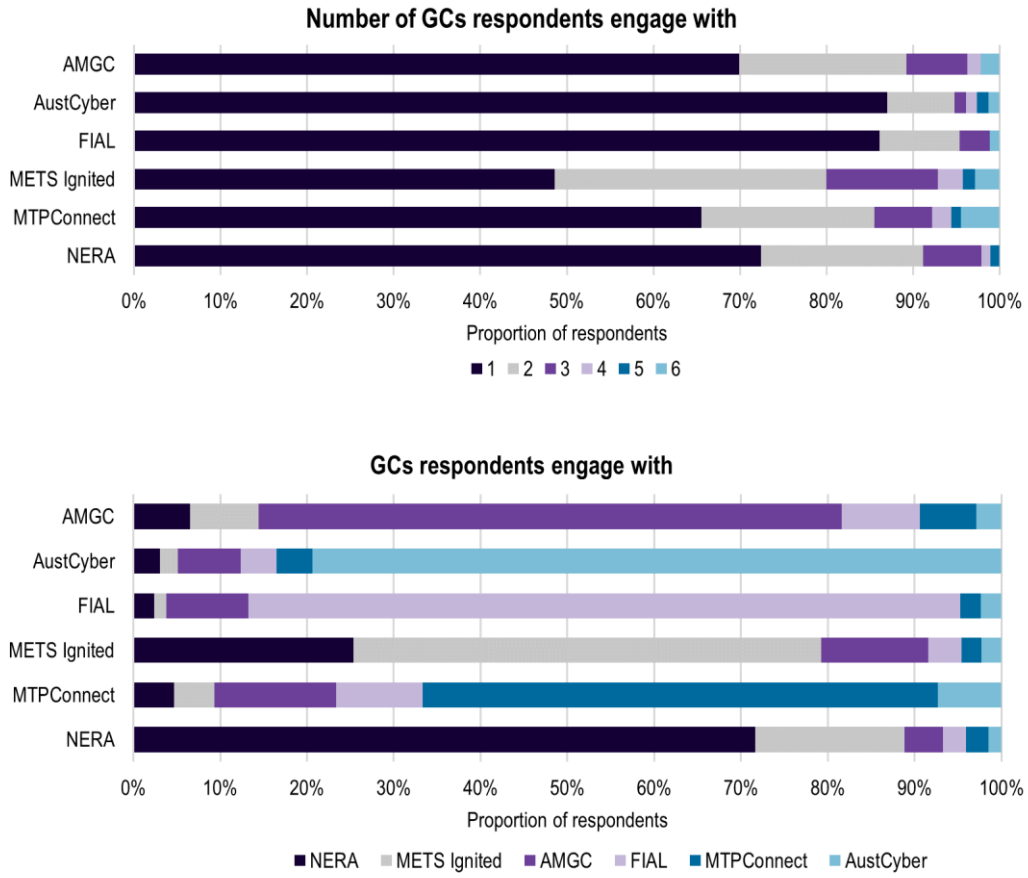


Note: Responses to survey question "My business / organisation is best described as" n=785.

Source: Survey of GC participants

Figure B.2, top chart, shows the number of interactions respondents have across the GCs. Most respondents have engaged with only one GC, ranging from 49 per cent for METS Ignited to 87 per cent for AustCyber (top chart). Very few respondents engage with more than two GCs. The GCs the respondents engage with are shown in Figure B.2, bottom chart. Respondents from METS Ignited are more likely to engage with NERA and vice versa, than other GCs. Respondents from FIAL and MTPConnect who engage with a second GC are most likely to engage with AMGC. FIAL is the most separated GC, recording the lowest proportion of respondents interacting outside of FIAL (18 per cent).

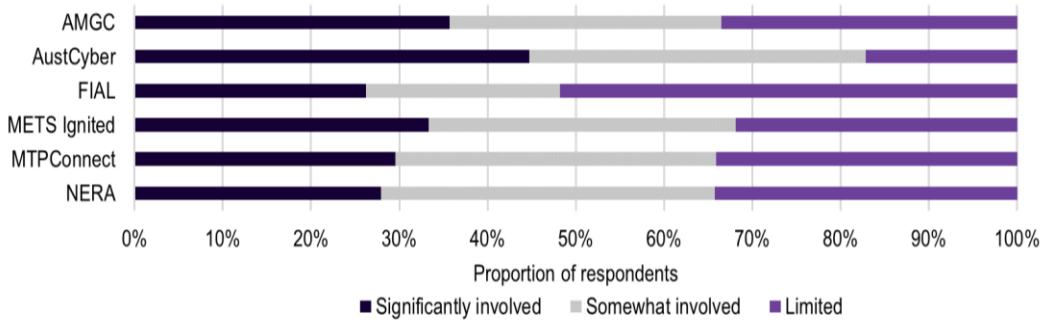
Figure B.2 Proportion of GC survey respondents interactions by number and GC



Note: Responses to survey question "I have interacted with (tick all that apply)" n=788.
Source: Survey of GC participants

Participants were fairly evenly distributed in their engagement with GCs (limited, somewhat, significantly involved – see Figure B.3.

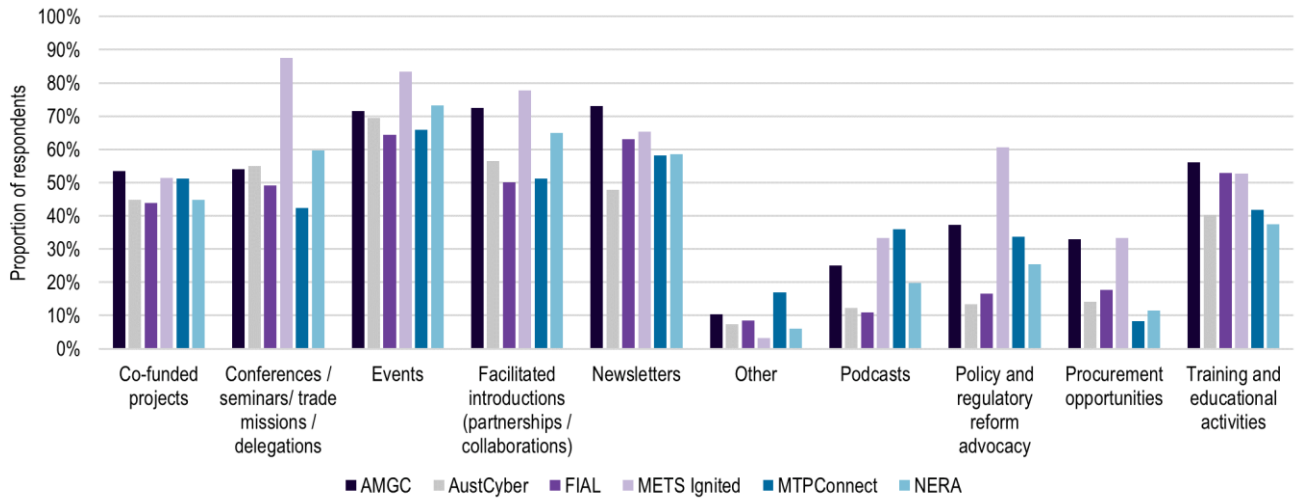
Figure B.3 Survey respondent engagement with GCs



Note: Responses to survey question "How would you describe your business / organisation's involvement in the Growth Centre? " n=773.
Source: Survey of GC participants

Participants engage with GCs through a range of activities. As shown in Figure B.4, participants predominantly engage with GCs through events, facilitated introductions, newsletters, conferences/seminars/trade missions/delegations and training and education.

Figure B.4 Nature of survey respondent engagement with GCs



Note: Responses to survey question "I have participated in, and found the following Growth Centre activities useful:" n=74.

Source: Survey of GC participants

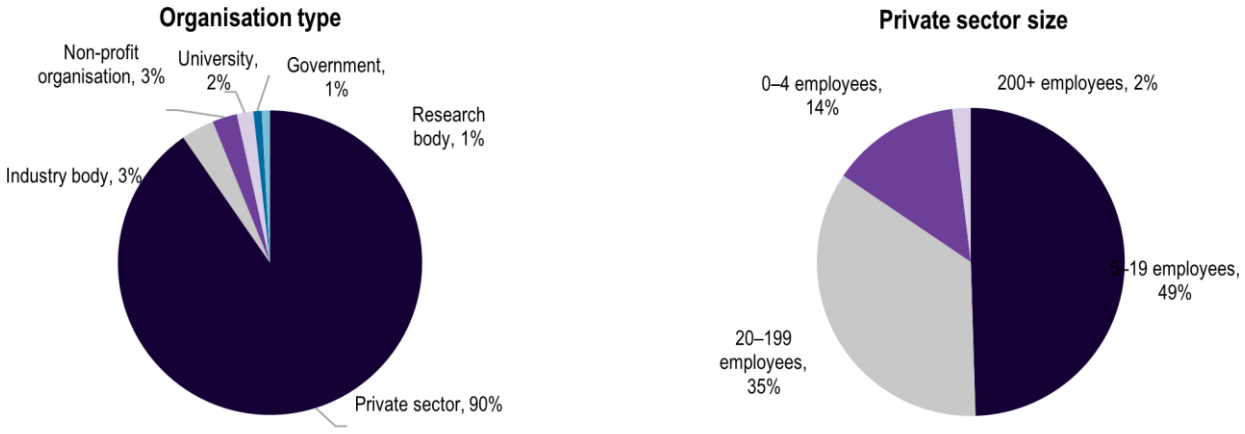
Non-participants

The survey was distributed using personalised emails on 14 July to a random sample of 1,485 EP recipients. Some 150 had duplicate email addresses (most commonly the same recipient who received grants under multiple ABNs, for example employees with '@csiro.au' email addresses), and a few others were not delivered. A total of 1,319 stakeholders received the request email. To boost response rates, the Department coordinated with the EP Program Area to distribute the non-participant survey through the EP monthly newsletter. This occurred on 5 August. The survey was closed on 10 August 2020. Of the 17 survey questions, one was mandatory, asking respondents to identify whether or not they had participated in the GCs. The remaining questions were optional (four of which were free-text responses).

Non-participant demographics

Figure B.5 shows the proportion of non-participants by type of organisation and size. This shows that the majority of respondents were from the private sector (90 per cent) and were small (5-19 employees, 49 per cent) and medium (20-199 employees, 35 per cent) sized. Most respondents were not even aware of the IGCI or GCs (82 per cent).

Figure B.5 Non-participant survey respondents by type and size



This graph relates to the survey question: "My business / organisation is best described as:" n=114, and "My business / organisation size has:" n=103.

Source: Survey of non-participants

Additional Supporting Information

C

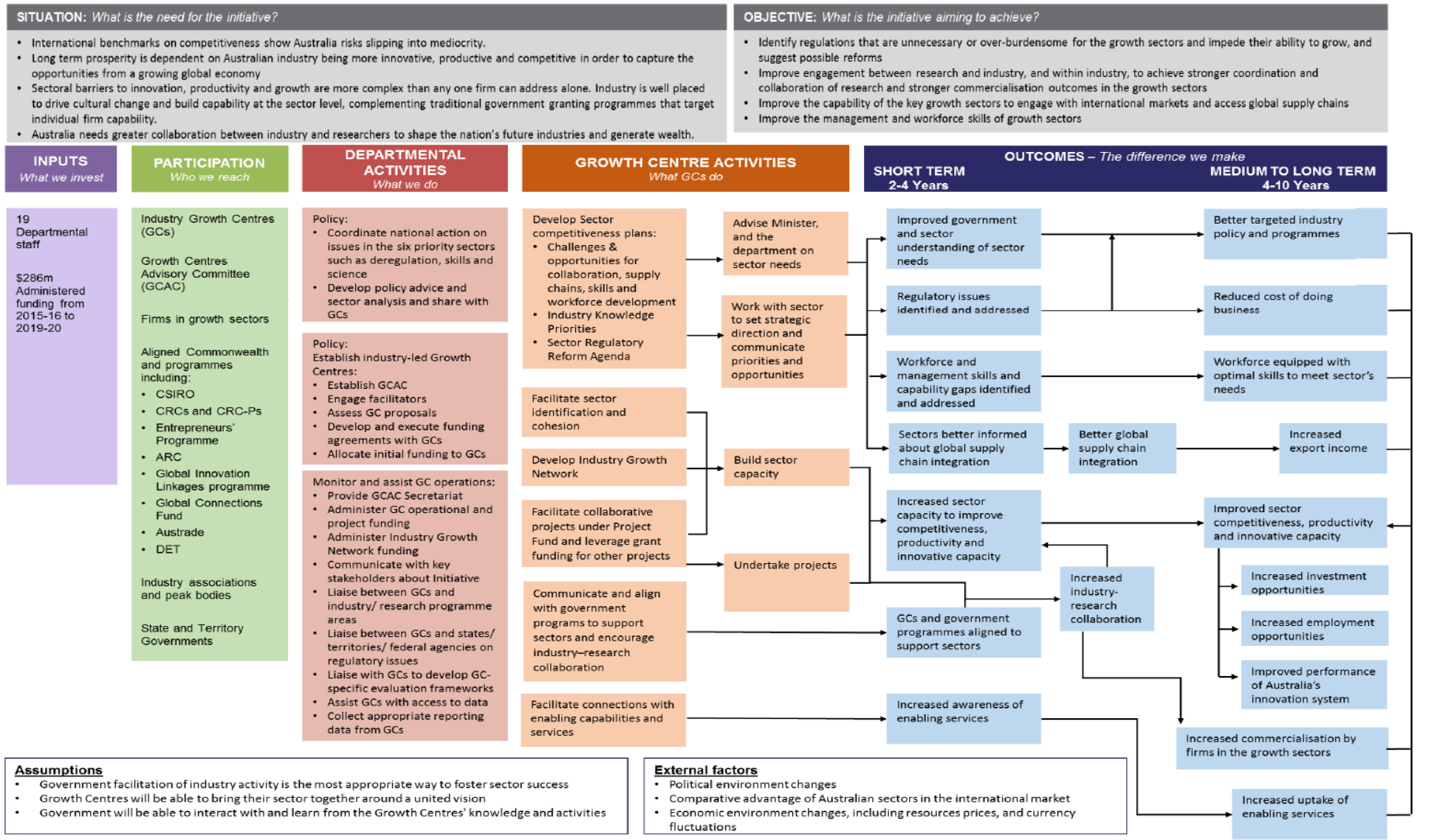
This Appendix contains supplementary information to support the analysis and findings presented in this report. This information has been ordered by the corresponding report chapter.

C.1 Industry Growth Centre Initiative – additional information

The information in this Appendix supports the analysis presented in Chapter 2: Industry Growth Centre Initiative.

The overarching Logic Model for the IGCI is provided in Figure C.1.

Figure C.1 IGCI Program Logic Model



Source: Department of Industry, Innovation and Science (N.D.). A- Evaluation Strategy - Industry Growth Centres, Internal Document. Canberra: Australian Government.

C.2 Objectives and design choices

The information supports the analysis presented in Chapter 3. It has been developed using information obtained during the desktop review.

Table C.1 aligns each GC's objectives with the IGCI and maps their change from when the GC was established to 2020.

Table C.1 Alignment between GC and IGCI objectives

GC	IGCI objectives				Other objectives
	Improve engagement to improve collaboration and commercialisation outcomes	**International markets and access to global supply chains**	**Identify unnecessary regulations**	**Improvement management and workforce skills**	
AMGC 2015 objectives	Increase value-adding services within the sector to improve value differentiation	Improve market focus by identifying under-served segments and linking into global value chains		Increase the technical leadership of sector to improve value differentiation Lift scale and management quality to improve cost competitiveness	
AMGC 2020 objectives Note: These objectives relate to all of the objectives of the IGCI	Set the direction for how Australian manufacturers can be globally competitive by conducting needs analysis and ongoing monitoring Demonstrate how to pursue AMGC's direction setting research by joint projects and highlight members that apply the research direction Generate awareness on direction setting research throughout the manufacturing ecosystem via communication methods, events, and on-line learning tools Reinforce direction setting actions by connection building, joint projects, and aligning with government and industry associations				
AustCyber 2016 objectives	Drive industry collaboration and coordination: enable connectivity and information flow to promote high levels of collaboration. This will reduce duplication and therefore allow better leverage of resources and create increased productivity		Pursue policy advocacy and reform: proactively recommend and support policy and regulatory reforms aimed specifically at the cyber security sector to foster an environment in which innovation and entrepreneurship can thrive	Increase value-adding services within the sector to improve value differentiation	Demonstrate leadership and coherence: create a national cyber security narrative and ensure cohesion across national cyber security programs, leading to accelerated industry investment and more rapid scaling
	Accelerate commercialisation: accelerate the creation and adoption of Australian based cyber security products, services, and best practices, domestically, regionally and globally				Improve market focus by identifying under-served segments and linking into global value chains
AustCyber 2020 objectives		Export Australia's cyber security capabilities to the world		Lift scale and management quality to improve cost competitiveness	Grow an Australian cyber security ecosystem

GC	IGCI objectives				Other objectives
	Improve engagement to improve collaboration and commercialisation outcomes	**International markets and access to global supply chains**	**Identify unnecessary regulations**	**Improvement management and workforce skills**	
FIAL	Enhancing industry-research collaboration and commercialisation	Improving the capability of sectors to engage with international markets and global supply chains	Identifying opportunities for regulatory reform	Improving management capabilities and workforce skills	
METS Ignited 2016 objectives	Enhancing industry research collaboration and commercialisation	Improving the capability of sectors to engage with international markets and global supply chains	Identifying opportunities for regulatory reform	Improving management capabilities and workforce skills	
METS Ignited 2020 objectives	Accelerating the commercialisation of innovation	Growing exports	Improving the regulatory environment	Enhancing industry skills and capabilities	
MTPConnect	Improving coordination and collaboration between research and industry, and within industry, to achieve stronger commercialisation outcomes	Improving capability of the sector to engage with international markets and access global supply chains	Identifying opportunities to address regulations that are unnecessary or overly burdensome and impede growth	Improving management and workforce skills necessary for sector growth	
NERA 2015 objectives	Promoting collaboration and innovation Commercialising industry-led research and technology	Reducing regulatory burden and building a globally competitive value chain		Developing workforce skills	
NERA 2019 objectives	Improving engagement between research and industry, and within industry, to achieve stronger coordination and collaboration of research and stronger commercialisation outcomes	Improving the capability of the key sectors to engage with international markets and access global supply chains	Identifying regulations that are unnecessary or over-burdensome for the six sectors and impede their ability to grow and suggesting possible reforms	Enhancing management and workforce skills	

*Source: MULTIPLE.*AMGC (2015 objectives): Advanced Manufacturing Growth Centre Sector Competitiveness Plan 2017.
AMGC (2020 objectives): as identified by AMGC, correspondence with Katie O'Connell 3 June 2020.
AustCyber (2016 objectives): AustCyber 2016-17 Annual Report, correspondence with Tony Stubbs 21 May 2020.
AustCyber (2020 objectives): AustCyber 2020-21 Business Plan, correspondence with Tony Stubbs 21 May 2020.
FIAL: FIAL 2020-21 Business Plan, as approved by FIAL, correspondence with Mirjana Prica 10 June 2020.
METS Ignited (2016 objectives): METS Ignited 2016-17 Business Plan, correspondence with Adrian Beer 19 May 2020.
METS Ignited (2020 objectives): METS Ignited 2020-21 Business Plan, correspondence with Adrian Beer 19 May 2020.
MTPConnect: MTPConnect 2020-21 Business Plan, correspondence with Dan Grant 1 June 2020.
NERA (2015 objectives): NERA 2015-16 Annual Report, correspondence with Cormac Dawson 20 May 2020.
NERA (2019 objectives): NERA 2018-19 Annual Report, correspondence with Cormac Dawson 20 May 2020.

C.3 Growth Centre delivery and administration

The information supports the analysis presented in Chapter 4: Growth Centre delivery and administration.

Table C.2 outlines the GC's contract funding by funding type from 2014-15 to 2021-22. The table excludes funding to be provided under the MMS.

In contrast to Table 4.1, Table C.2 includes the bridging agreement funding provided to META (the previous advanced manufacturing Industry Innovation Precinct. META was subsequently discontinued.

Table C.2 Details of IGCI funding

	2014-15 (E)	2015-16 (E)	2016-17 (E)	2017-18 (E)	2018-19 (E)	2019-20 (E)	2020-21 (C)	2021-22 (C)	Total
AMGC	**68,751**	**5,028,138**	**7,181,300**	**12,750,000**	**9,000,000**	**6,300,000**	**6,000,000**	**-**	**46,328,188**
Advertising and marketing	-	5,253	-	-	-	-	-	-	5,253
Advanced manufacturing early stage research fund	-	-	-	1,000,000	1,000,000	1,000,000	1,000,000	-	4,000,000
Chairs	68,751	7,885	-	-	-	-	-	-	76,635
Industry leaders - facilitators	-	25,000	-	-	-	-	-	-	25,000
Operational funding	-	3,200,000	3,500,000	3,500,000	3,500,000	5,300,000	5,000,000	-	24,000,000
Project fund	-	1,400,000	3,200,000	8,000,000	3,000,000	-	-	-	15,600,000
Regulatory reform	-	-	81,300	-	-	-	-	-	81,300
Sector informed grants	-	390,000	400,000	250,000	1,500,000	-	-	-	2,540,000
AustCyber	**-**	**-**	**4,063,425**	**6,727,273**	**10,680,000**	**8,680,000**	**5,180,000**	**5,000,000**	**40,330,698**
Advertising and marketing	-	-	9,091	-	-	-	-	-	9,091
Industry Growth Network (IGN)	-	-	220,000	-	180,000	180,000	180,000	-	760,000
Industry leaders - facilitators	-	-	334,334	-	-	-	-	-	334,334
Operational funding	-	-	3,500,000	3,500,000	3,500,000	3,500,000	5,000,000	5,000,000	24,000,000
Project fund	-	-	-	3,000,000	7,000,000	5,000,000	-	-	15,000,000
Sector informed grants	-	-	-	227,273	-	-	-	-	227,273
FIAL	**3,000,000**	**4,235,600**	**7,149,432**	**12,295,455**	**6,754,090**	**5,000,000**	**5,000,000**	**-**	**43,434,577**
Advertising and marketing	-	15,240	5,855	-	4,545	-	-	-	25,640
Bridging agreements	1,750,000	-	-	-	-	-	-	-	1,750,000
Chairs	-	-	-	-	-	-	-	-	-
Operational funding	1,250,000	2,250,000	3,500,000	3,500,000	3,500,000	5,000,000	5,000,000	-	24,000,000
Project fund	-	1,400,000	3,200,000	8,000,000	3,000,000	-	-	-	15,600,000
Regulatory reform	-	180,360	82,977	500,000	-	-	-	-	763,337
Sector informed grants	-	390,000	360,600	295,455	249,545	-	-	-	1,295,600

	2014-15 (E)	2015-16 (E)	2016-17 (E)	2017-18 (E)	2018-19 (E)	2019-20 (E)	2020-21 (C)	2021-22 (C)	Total
META	**240,000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**240,000**
Bridging agreement	240,000	-	-	-	-	-	-	-	240,000
METS Ignited	**151,649**	**5,613,960**	**7,637,819**	**11,977,240**	**6,668,237**	**4,365,888**	**5,000,000**	**1,250,000**	**42,664,793**
Business development managers	65,000	16,997	-	-	-	-	-	-	81,997
Chairs	86,648	40,888	-	-	-	-	-	-	127,537
IGN	-	749,075	456,519	197,240	168,237	32,888	-	-	1,603,959
Operational funding	-	2,917,000	3,500,000	3,500,000	3,500,000	4,333,000	5,000,000	1,250,000	24,000,000
Project fund	-	1,400,000	3,200,000	8,000,000	3,000,000	-	-	-	15,600,000
Regulatory reform	-	100,000	81,300	-	-	-	-	-	181,300
Sector informed grants	-	390,000	400,000	280,000	-	-	-	-	1,070,000
MTPConnect	**76,400**	**4,666,094**	**7,141,900**	**11,780,000**	**6,500,000**	**4,625,000**	**5,000,000**	**1,250,000**	**41,039,393**
Business development managers	30,000	57,093	-	-	-	-	-	-	87,093
Chairs	46,400	69,000	-	-	-	-	-	-	115,400
Operational funding	-	2,625,000	3,500,000	3,500,000	3,500,000	4,625,000	5,000,000	1,250,000	24,000,000
Project fund	-	1,400,000	3,200,000	8,000,000	3,000,000	-	-	-	15,600,000
Regulatory reform	-	125,000	81,300	-	-	-	-	-	206,300
Sector informed grants	-	390,000	360,600	280,000	-	-	-	-	1,030,600
NERA	**45,222**	**4,288,284**	**7,140,175**	**11,750,000**	**6,500,000**	**3,958,000**	**5,000,000**	**2,500,000**	**41,181,681**
Advertising and marketing	-	-	5,000	-	-	-	-	-	5,000
Business development managers	14,790	84,598	-	-	-	-	-	-	99,388
Chairs	30,432	246,686	-	-	-	-	-	-	277,118
Operational funding	-	2,042,000	3,500,000	3,500,000	3,500,000	3,958,000	5,000,000	2,500,000	24,000,000
Project fund	-	1,400,000	3,200,000	8,000,000	3,000,000	-	-	-	15,600,000
Regulatory reform	-	125,000	81,300	-	-	-	-	-	206,300

	2014-15 (E)	2015-16 (E)	2016-17 (E)	2017-18 (E)	2018-19 (E)	2019-20 (E)	2020-21 (C)	2021-22 (C)	Total
Sector informed grants	-	390,000	353,875	250,000	-	-	-	-	993,875
Grand total	**3,582,021**	**23,832,076**	**40,314,051**	**67,279,967**	**46,102,328**	**32,928,888**	**31,180,000**	**10,000,000**	**255,219,331**
IGCI administration costs		**275,000**	**550,000**	**550,000**	**550,000**	**550,000**	**550,000**		**3,025,000**

Note: (e): expended, (c): committed.

Source: ACIL Allen Consulting 2020, Department data.

Table C.3 outlines the GC's contract and actual funding by funding type aggregated across the life of the agreement (2014-15 to 2021-22). This table includes the discrepancy between the contract and actual values. The table excludes funding to be provided under the MMS.

Table C.3 GC contract funding vs actual funding

Row Labels	Contract Value	Actual expenditure and committed funding	Discrepancy (contract – actual)
AMGC	**46,350,185**	**46,328,188**	**(21,997)**
Advertising and marketing	-	5,253	5,253
Advanced manufacturing early stage research fund	4,000,000	4,000,000	-
Chairs	103,885	76,635	(27,249)
Industry leaders - facilitators	25,000	25,000	-
Operational funding	24,000,000	24,000,000	-
Project fund	15,600,000	15,600,000	-
Regulatory reform	81,300	81,300	-
Sector informed grants	2,540,000	2,540,000	-
AustCyber	**40,321,364**	**40,330,698**	**9,334**
Advertising and marketing	9,091	9,091	-
Industry growth network (IGN)	760,000	760,000	-
Industry leaders - facilitators	325,000	334,334	9,334
Operational funding	24,000,000	24,000,000	-
Project fund	15,000,000	15,000,000	-
Sector informed grants	227,273	227,273	-
FIAL	**43,441,803**	**43,434,577**	**(7,226)**
Advertising and marketing	20,000	25,640	5,640
Bridging agreements	1,750,000	1,750,000	-
Chairs	-	-	-
Operational funding	24,000,000	24,000,000	-
Project fund	15,600,000	15,600,000	-
Regulatory reform	776,204	763,337	(12,866)
Sector informed grants	1,295,600	1,295,600	0
META	**240,000**	**240,000**	**-**
Bridging agreements	240,000	240,000	-
METS Ignited	**42,755,118**	**42,664,793**	**(90,325)**
Business development managers	90,000	81,997	(8,003)
Chairs	191,819	127,537	(64,282)
IGN	1,621,999	1,603,959	(18,040)
Operational funding	24,000,000	24,000,000	-
Project fund	15,600,000	15,600,000	-
Regulatory reform	181,300	181,300	-
Sector informed grants	1,070,000	1,070,000	-

Row Labels	Contract Value	Actual expenditure and committed funding	Discrepancy (contract – actual)
MTPConnect	**41,177,542**	**41,039,393**	**(138,149)**
Business development managers	120,000	87,093	(32,907)
Chairs	220,642	115,400	(105,242)
Operational funding	24,000,000	24,000,000	-
Project fund	15,600,000	15,600,000	-
Regulatory reform	206,300	206,300	-
Sector informed grants	1,030,600	1,030,600	-
NERA	**41,322,900**	**41,181,681**	**(141,219)**
Advertising and marketing	5,000	5,000	-
Business development managers	100,000	99,388	(612)
Chairs	411,000	277,118	(133,882)
Operational funding	24,000,000	24,000,000	-
Project fund	15,600,000	15,600,000	-
Regulatory reform	206,300	206,300	-
Sector informed grants	1,000,600	993,875	(6,725)
Grand total	**255,608,912**	**255,219,331**	**(389,581)**

Note: Differences between contract value and actual expenditure result from direct payments (with no contract required) and the full value of some contracts not used.
Source: ACIL Allen Consulting 2020, Department data: Growth Centre Snapshot 11 June 2020.

C.4 Monitoring and evaluation

This Section outlines the analysis for Section 4.3.

C.4.1 Measuring performance

Key performance indicators

To gauge the success of the activities and projects being pursued, GCs have articulated overall visions/targets for their sectors. For instance NERA aims to *"… help deliver transformational change and sector-wide impact to unlock +$10 billion of new value for the benefit of all Australians*."[150] While aspirational targets of this nature are useful in articulating a vision about what GCs want to achieve, it is very difficult to measure progress against them and even harder to demonstrate attribution of such progress to GC activities. This is because the targets GCs are trying to achieve are complex, distant and require input from a very broad range of stakeholders.

The questions and indicators identified in the Evaluation Data Framework focus on the IGCI's four objectives, and additional or indirect (spillover) outcomes. The IGCI Evaluation Data Framework was amended to address the issues specified in the Post-Commencement Evaluation, and was updated again in October 2019 (likely to reflect the development of individual GC Program Logics).[151] These include details for indicators and data sources, specific questions that are phrased so as to avoid a yes/no answer, linking questions with outcomes, focusing on outcomes rather than outputs, and including questions on leveraged funding and enabling services.

However, there is poor consistency between the KPIs in the IGCI Evaluation Data Framework and those in the GC Performance Frameworks, and poor consistency between the GC Performance Frameworks and GC Business Plans. Only AMGC and MTPConnect reference the Performance Frameworks in their 2020-21 Business Plans.

[150] NERA (2019). *NERA Annual Report 2018-19*. Perth: NERA.

[151] Office of the Chief Economist (2016). Op. cit.

The GC KPIs, as identified in their Business Plans, often focus on ensuring alignment between GC business activities and their visions/strategies. This supports monitoring of organisational and operational performance. In particular, they tend to be *activity* and *output* based with little heed to impact. They focus on issues such as strategic leadership, stakeholder engagement and communication, project management, and governance and operations. In line with the varied approach taken by GCs in developing their Performance Frameworks, GCs have each taken a different approach to developing SCPs and complying with their Annual Reporting requirements. Their approach is often more closely aligned to corporations' law reporting norms than to government program requirements. This reflects that they are 'industry-led' entities with accountability to their industry partners as well as government.

KPIs of this nature shed only limited insights on progress towards the sectoral economic target and attribution to the GCs, and are of even less value in assessing the impact of the IGCI.

Given the importance of the Department being able to clearly demonstrate that the IGCI 'has made a difference' and that the impact can be attributed to the program, there would be merit in developing Specific, Measurable, Achievable, Realistic, and Timely (SMART) KPIs that are focused on the outcomes and impact of each GC, and directly relating these to the IGCI objectives. This would enable comparison across GCs and a collective assessment of the performance of the IGCI.

However, given the advanced stage of program implementation the opportunity to develop/refine the necessary metrics may have passed.

Data collection

The Evaluation Data Framework outlines 20 questions under six initiative outcome areas: overall initiative, commercialising research, workforce management and skills, access to markets, regulatory reform and additional or indirect (spillover). The questions are addressed through a series of indicators and supported by data collection sources. As discussed in Section 1.4.2, the collection of data is a shared responsibility between the GCs and the Department and other government agencies. The GCs are responsible for collecting data for nine of these questions.

The data examined for the Evaluation focused on data sourced from GCs and publicly available information, in line with the Evaluation Data Framework. The analysis also examined whether the GCs have collected other data which may be relevant to the Evaluation Data Framework.

ACIL Allen has assessed the quality of data according to the following criteria:

— *Coverage:* what data available across the Evaluation Data Framework?

— *Appropriateness*: are the data collected by individual GCs appropriate for the purpose of impact measurement or evaluation? This includes questions of data definition and quality, as well as whether the data are measuring outcomes, rather than inputs or outputs.

— *Consistency:* are the GCs collecting data in similar ways, to enable measurement of the impact of the IGCI?

Figure C.2 summarises the assessment of data available for each GC against the Evaluation Data Framework. Stars (★) indicate that data are available, ticks (✓) indicate where those data refer to outcomes, rather than inputs or outputs, and 'R' indicates that the data provided by the GC is replicable across other GCs.

Replicability is considered only for data that are outcome focused, which is in line with good practice approaches to evaluation. The assessment of replicability is based on whether the data are context independent, that is, where data are not collected as a result of a specific initiative or activity, and instead are expressed in terms that are consistent with other GCs (e.g. estimated numbers of jobs or value in dollars).

The overall conclusions from the assessment are as follows:

— *There are significant gaps in data collected by the GCs* – several Performance Framework areas are not populated by any GC. Each GC has at least one area where other GCs have presented data, but they have not.

— *GC reporting tends to focus on inputs/outputs* – there are few areas where the data are outcome-focused (mainly related to spillover effects). This is partly, but not entirely, explained by the metrics prescribed in the Evaluation Data Framework, which also focus on inputs/outputs rather than outcomes. There are areas where some GCs have been

able to provide outcome-relevant information, despite the Evaluation Data Framework guiding the GCs to focus on inputs/outputs.

— *There are cases of exemplar practice, which should be replicable by other GCs* – although rare, there are some areas where GCs report on outcomes. Other GCs should be able to replicate this approach.

Figure C.2 Summary of data coverage, appropriateness and consistency by GC

	AMGC	AustCyber	MTPConnect	FIAL	METS	NERA
Overall Initiative						
Productivity [non GC measures proposed in Evaluation Data Framework]						
Competitiveness [non GC measures]						
Innovation-active businesses [non GC measures]						
Commercialising Research						
Industry-industry and industry-research collaboration	★	★	★	★	★	★
Increased commercialisation [non GC measures]			★✓			★✓
Workforce management and skills						
Management skills needs and capability gaps being identified and addressed	★	★✓	★	★	★	★
GCs involved with and influencing industry and government skills and training processes		★	★		★	★
Workforce equipped with the skills needed to meet the sector's needs [non GC measures]	★✓R					
Access to markets						
Sectors better informed about global supply chain integration	★✓		★	★	★	★
Firms targeting new export markets			★			
Firms experiencing increased export income [non GC measures]						
Regulation reform						
Number/estimated value of reforms [being] implemented	★	★	★	★	★	★
Number/estimated value of reforms implemented						
Impact of government regulations and compliance [non GC measures]						
Additional or Indirect (spillover)						
Awareness of the GC initiative	★✓R	★✓R	★✓R	★✓R	★✓R	★✓R
GC activities aligning with other government programs	★✓R		★✓R	★	★✓R	★
Increase in high- skilled jobs? [non GC measures]						
Impacted the capability/capacity of other sectors [non GC measures]						
Increased awareness/uptake of enabling services [non GC measures]						
Are industry policy and programs better targeted? [non GC measures]						

Notes: Stars indicate where data are available, regardless of the quality or appropriateness of the data. Ticks indicate the data are outcome focused. 'R' indicates where it is expected that outcome focused reporting approaches could be replicable by other GCs.

Grey area headings and grey cells indicate Evaluation Data Framework areas where GCs were not identified as key sources of information.

Source: ACIL Allen Consulting 2020

Several issues of coverage, appropriateness and consistency were identified through the assessment. Some of the drivers of these issues are discussed below. This is followed by a discussion of the findings and recommendations that arise from the assessment of information that has been available to date.

Coverage

There was full coverage of GC data across four of the nine Performance Framework questions. That is, all GCs reported on some data relevant to four areas.

Gaps in GC reporting were found for five areas including:

— GCs involved with and influencing industry and government skills and training processes: Information was found in relation to AustCyber, METS Ignited, MTPConnect and NERA.

— Sectors better informed about global supply chain integration: No information was found for AustCyber.

— *Firms targeting new export markets*: MTPConnect was the only GC to report data.

— *Number/estimated value of reforms implemented*: No data was reported by any GC, although it may be too early to assess any impacts of reforms. Further, implementation of reforms is outside the control of the GCs.

— GC activities aligning with other government programs: No data was found for AustCyber.

In general, the GCs did not report information for questions they were not expected to collect. Two exceptions to this were:

— *Increased commercialisation:* MTPConnect reported information on projects resulting in commercialisation outcomes, and NERA provided case studies of commercialisation activities by participating firms. Although this is a non-GC measure, there is scope for the GCs to collect information on this question.

— *Workforce skills*: AMGC reported estimates of the numbers of new jobs, upskilled jobs, formal training, STEM skills improvement and management skills improvement.

Importantly, even where all GCs have reported information against a Performance Framework area, the data are not necessarily appropriate or consistent. This is described below.

Appropriateness

The data were often insufficient to determine the impacts from GC activities. Some of the key factors identified through the data review are summarised below:

— *Data are reported for purposes other than evaluation* – Data were sourced from Annual Reports and other public materials, with the exception of FIAL and AMGC which provided materials specifically to support the Evaluation. Otherwise, data were not specifically produced by the GCs for the purpose of the Evaluation. This means that available data from four GCs are generally high-level, and the GCs present the data as lists of projects or activities, rather than as dollar values or data sets that would be more appropriate for examining the collective impact of the GCs.

— *There is a limited focus on the Performance Framework* – The GCs are not required to report specifically against the Performance Framework or data strategy. In some cases, although data are available, they do not align to the required outputs. For example, ACIL Allen has found only limited data on management skills needs that addressed the question of skills gaps and how they are being managed. Instead, management skills data commonly consisted of information on workshops and programs (i.e. activities) delivered by the GCs.

— *Time series breaks*: There are instances where the data available from individual GCs varies over time – for example, MTPConnect updated their Customer Relationship Management (CRM) system in 2018. In doing so, they were unable to migrate all of their data to the new system. This means that consistent time series data on firm-level interactions does not exist.

— *A focus on inputs or outputs, rather than outcomes*: This focus is appropriate in some circumstances and should be collected at a minimum. However, the focus on inputs or outputs makes it challenging to discern whether the GCs are having an impact. To measure impact, the GCs will need to re-frame their data collection to examine outcomes. For example, most GCs reported on workshops delivered on global supply chain integration, rather than on whether the participating firms had actually increased their knowledge of supply chain integration, or been able to put that knowledge into use. Simply reporting on the workshops delivered does not allow for reporting on the impact of the GC on "To what extent are sectors better informed about global supply chain integration?"

There are cases of some GCs reporting on outcomes in a way that could be replicated by other GCs. This would build consistency across the GCs and support the assessment of the IGCI. For example, AMGC reported on a small (n=6) survey of manufacturers that were better connected to global value and/or supply chains. This could be expanded to a larger sample and applied by other GCs.

Consistency

The most significant issue identified in the analysis was consistency in the data available from the GCs. In most cases, the data from the GCs are not comparable. This limits the potential to evaluate the collective impact of the IGCI.

The primary data consistency issues are:

— *Various definitions for key terms* – For example, the GCs used different terms related to firm engagement, such as the definition of 'workshop'. This could refer to seminars, roadshows, meetings, training, presentations, or other interactions. In some cases where GCs reported against Performance Framework outcomes, it is unclear whether the GCs used a consistent understanding/definition of each outcome or question.

- *Scope of data collection* – the GCs do not appear to be collecting the same range of data – even on firm engagement. For example, in relation to CRM information provided by the GCs:
  - AMGC provided membership data only
  - AustCyber provided only a list of ABNs of businesses that they had interacted with, rather than the type and nature of interaction
  - FIAL provided 2015-16 data only
  - METS Ignited included email interactions (the only GC to do so)
  - MTPConnect noted the change in CRM in 2018, and has not collected data from third parties engaged to provide firm interactions on their behalf
  - NERA noted that their data did not include many types of interactions, such as speaking engagements, panel sessions, and presentations.
- *Sector-specific differences* – Some GCs run sector-specific programs which produce data that are not comparable to other GCs (which do not necessarily run the same types of programs for their sectors).
- *Scope of reporting* – Reporting available from the GCs differs in style and granularity. For example, some GCs refer to the total number of regulatory reforms being sought, while others provide estimates of the value or expect impact of the potential changes. Where estimates are supplied, the basis on which they have been calculated is not always clear.

Key practices by Evaluation Data Framework area

Table C.4 provides a more detailed assessment of the quality of data relating to each area in the Evaluation Data Framework, including the practices and approaches used by each GC to date, and suggestions for improvement that may be considered by the Department and GCs.

Table C.4 Summary of key practices and suggestions for improvements

Evaluation Data Framework area	Practices and approaches	Suggestions for improvements
Commercialising Research		
Industry-industry and industry-research collaboration	– The numbers and value of project funding and partners and other relevant details is being consistently captured across each GC. – Numbers and locations of workshops and the number of attendees were reported by only some of the GCs (FIAL, METS Ignited, MTPConnect, and NERA). The use of the term 'workshop' differed between GCs (seminars, roadshows, meetings, training, presentations, etc) and was presented differently in the reports. At times, the date and number of attendees were disaggregated by workshop, other instances reported aggregate figures. – Some GCs reported industry-specific activities as inputs into increasing collaboration. These cannot be readily compared across all GCs (for example, AMGC Export Hub, FIAL's Australia Food Catalogue, METS Ignited's QLD Work Program and Clusters, and NERA's CORE Innovation Hub and Opportunity Knocks). – The number of CRM connections made over time and following workshops was not fully reported by any GC. – The number and value of total and successful GC participant applications in the EP, CRC and ITRP were captured by most of the GCs (AMGC, FIAL, METS Ignited, MTPConnect, NERA). However, reporting by individual GCs has not been consistent over time, and the format for data reporting differs between GCs (some provided in tables or text in different sections of reports). – Reporting on projects, including the level of detail, varied between documents within a GC. This could be partly explained by the timing of the document's release.	Establish consistent standards for CRM systems, including clear definitions of key terms, counting rules. Identify appropriate outcomes measures to supplement operational reporting. For example, measures of collaboration between participant firms outside of GC workshops / funded projects.

Evaluation Data Framework area	Practices and approaches	Suggestions for improvements
	– Some GCs self-reported progress against the Performance Frameworks. It is not clear if a consistent understanding/definition for each part of the Framework was used. – Some GCs reported industry-specific outcomes for projects, which cannot be readily compared across the GCs.	
Increased commercialisation	– There was little evidence of the number of new/improved goods or services in the growth sectors and proportion of firms collaborating in growth sectors. – MTPConnect provided estimates of Economic, Commercial and R&D Activity and Collaboration outcomes (around ten outcomes, for example, Gross Value Added, jobs, exports, capital raised, patents, etc) and NERA provided some descriptions of organisation's commercialisation efforts.	Establish a consistent methodology to estimate the increase in economic indicators for each GC sector, following the approach of MTPConnect. Ask the GCs to supplement this with case studies of firms engaging in new/improved goods or services.
Workforce management and skills		
Management skills needs and capability gaps being identified and addressed	– GCs provided no evidence of the number and description of gaps identified and actions taken to address these gaps. – GCs mostly reported on inputs to addressing management skills needs and capability gaps such as the names, number of, value of and number of projects related to workforce management and skills; number of related workshops (using broad definitions, as described above) and reports (NERA only). – Some GCs (AMGC, AustCyber) reported outcomes from specific activities (Manufacturing Academy and CyberTaipan Pilot Program). This approach cannot be consistently undertaken for each GC, preventing its contribution to assessment of the IGCI as a whole.	Confirm the GCs' understanding of the requirement for this area, including listing the capability gaps and when and how they are addressed.
IGCs involved with and influencing industry and government skills and training processes	– There was little evidence of the numbers and description of GC involvement with government skills and training processes. One exception was AustCyber, who provided some information. – METS Ignited reported on the number of partners in a BHERT Round Table and NERA provided some description of name and number of work (reports and collaborations with government on programs) related to government skills and training processes.	Provide descriptions to the GCs on the types of activities / memberships that may be relevant to this outcome. Encourage reporting on the types of decisions that have been informed through participation in GC education and training.
Workforce equipped with the skills needed to meet the sector's needs	– AMGC provided estimates of new jobs, upskilled jobs, formal training, STEM skills improvement and management skills improvement. MTPConnect also provided some information. – No information could be found for other GCs.	Examine the applicability of AMGC's approach to other GCs, to support comparable, outcomes-focused information collection for this question.
Access to markets		
Sectors better informed about global supply chain integration	– GCs reported primarily on inputs, such as names, dollar value, and number of projects related to global supply chain integration, number of related workshops and international events, trade missions and industry guides or publications. – AMGC conducted a small (n=6) survey of manufacturers who reported being better connected to global value and/or supply chains.	AMGC's approach demonstrates a suitable and scalable means to measure the impact or outcome of GCs' efforts. Consider its application to other GCs.

Evaluation Data Framework area	Practices and approaches	Suggestions for improvements
Firms targeting new export markets	– There was little evidence of the extent to which are firms targeting new export markets. – MTPConnect provided some information relating to the extent that firms target new export markets, however this was provided as a total number, rather than the proportion of firms targeting new export markets (as specified in the data framework).	The use of case studies, as proposed in the Evaluation Data Framework, could build the evidence base for this question.
Firms experiencing increased export income	– No available reporting.	This may be better addressed with BLADE analysis.
Regulation reform		
Number/estimated value of reforms [being] implemented	– GCs reported on the number but not the estimated value of reform opportunities being identified and progressed. – The GCs reported the names and number of Regulatory Reform work (reports in progress or delivered, advocacy efforts, committees such as New Australian Technical (NERA) and other industry-specific activities such as FIAL Pilot reform registry with AMGC and food safety certification harmonisation). – METS Ignited reported data which serve as an input into reform implementation such as the names, number of, value of and number of projects related to regulatory reform. – FIAL reported the number of reform measures and estimated impact of a single reform measure.	Consider extending FIAL's approach to estimating the impact of a single reform measure to other reforms, and to other GCs. It is noted that use of the Department's regulatory cost calculator is already recommended by the Evaluation Data Framework.
Number/estimated value of reforms implemented	– No available reporting.	Expected to be populated over time once reforms are implemented.
Impact of government regulations and compliance	– No available reporting.	This is such a broad question that it is not likely to be addressable.
Additional or Indirect (spill-over)		
Awareness of the IGC initiative	– The results of 2018 Woolcott survey[152] captured consistent suitable output data relating to the awareness of the IGCI. This included awareness of the relevant GC for the respondent's sector, awareness of the IGCI, interest in getting further involved with a GC, and awareness of sources of industry information produced by a GC. – All GCs reported media and social media figures. There was no consistent approach or presentation of these figures. Further, inconsistency was observed within individual GC documentation over time.	Provide a reporting template to the GCs on the presentation of awareness / engagement figures and agree on definitions of key terms.
IGC activities aligning with other government programs	– The number and value of all and successful growth sector participant applications in the EP, CRC and ITRP were captured by most of the GCs (AMGC, MTPConnect, FIAL, METS Ignited, NERA). Data were not consistent over time, or between GCs (e.g. some provided in tables or text in different sections of reports).	Develop a consistent reporting approach for application outcomes (both successful and unsuccessful), or for provision of raw data representing these outcomes.
Increase in high- skilled jobs?	– No available reporting.	This may be better addressed with BLADE analysis.

[152] Woolcott Research & Engagement (2018). *Industry Growth Centres Initiative Study*. NSW: Woolcott Research & Engagement.

Evaluation Data Framework area	Practices and approaches	Suggestions for improvements
Impacted the capability/capacity of other sectors	– No available reporting.	Apart from anecdotal reporting, it is hard to see how the GCs could address this issue.
Increased awareness/uptake of enabling services	– No available reporting.	No suggestions identified.
Are industry policy and programs better targeted?	– No available reporting.	No suggestions identified.

Source: ACIL Allen Consulting 2020

C.4.2 Individual Performance Frameworks

As outlined in Section 4.3, the GCs developed individual Performance Frameworks in collaboration with the Department during 2019. The Performance Frameworks are intended to be flexible to meet sector- and GC-specific needs and meaningful to the GCs. They include a core set of measures intended for aggregation and measurement at the IGCI-level.

This section does not consider future changes the Department may make following the announcement of the MMS[153] and funding extension, to require the GCs to conduct regular and meaningful reporting, including reporting on specific KPIs.

To assess the suitability of these Performance Frameworks for future potential evaluations, we have assessed their consistency, and the appropriateness of the measures proposed. This assessment identifies substantial differences in the approach taken by each GC and the absence of a core, consistent set of measures in the Performance Frameworks. This prevents assessment of the IGCI.

The lack of consistency is illustrated in Section C.4 by detailed examination of one element of the Performance Frameworks.

Core *objectives*

As an example, we considered some of the *core* outcomes related to commercialisation. Commercialisation is measured according to two questions:

- To what extent is there increased industry-industry and industry-research collaboration occurring?
- To what extent has there been increased commercialisation by firms in the growth sectors?
- Key observations from our assessment and comparison of GC Performance Frameworks include:
- Four GCs (AMGC, FIAL, MTPConnect, and NERA) included objectives to examine the extent to which firms have improved their commercialisation outcomes:
  - there are substantial differences in the wording of the objectives – for example, AMGC and NERA refer to participating firms, FIAL refers to 'participating firms and the sector', and MTPConnect refers to 'participating firms, research organisations and researchers'. These creates comparability issues unless 'participating firms' are reported separately by FIAL and MTPConnect.
  - FIAL's reference to the 'sector' is a much broader scope than other GCs. It is unclear how FIAL will obtain this representative view.
  - METS Ignited refers to funding (and separately to collaboration) that may result in commercialisation, but not the extent to which commercialisation itself is achieved overall.
  - FIAL and NERA also state objectives for research grants to support commercialisation.
  - AustCyber refers to 'more innovative products and services commercialised'. They also refer to commercialisation as an outcome of other input-focused objectives (such as sector knowledge and infrastructure).

[153] Australian Government (2020). Op. cit.

- Several objectives related to commercialisation measure collaboration, which is referred to by the GCs in different ways:
  - AMGC's objectives separately consider collaboration between firms *in* the sector, between firms and research institutions, between firms and AMGC participants, and between AMGC participants and research institutions.
  - AustCyber refers to greater collaboration between businesses and between business and researchers. The metrics proposed (including measures of sentiment on the value of collaboration) indicate that the intent is on the quality of engagement as well).
  - FIAL refers to collaborations between firms (and/or research centres) making it unclear exactly what they plan to measure.
  - METS Ignited refers to collaboration between mining, METS, and research sectors, as well as collaboration that supports commercialisation.
  - MTPConnect seeks to address the extent to which national and international collaborations by researchers, start-ups and SMEs will increase, bringing a different scope of collaboration to be considered.
  - FIAL, METS Ignited, and MTPConnect also discuss 'enhancement' of collaboration, implying that it is the quality of collaboration in addition to the quantity that will be measured. This contrasts to the other GCs.
  - NERA refers to collaboration between firms and research centres. It separately considers firms sharing resources, research outcomes, capabilities, and skills. It is not clear whether this is intended to be the same as firm collaboration (and if so with whom?). The metric proposed to measure the objective does not clarify this.
- Four GCs (AMGC, AustCyber, FIAL, and NERA) mention clusters (or superclusters). Similar discrepancies arise in terms of how these are defined and measured.

These observations are consistent with the analysis about headline IGCI and GC objectives provided in Chapter 3.

Additional Performance Framework questions

In addition to the differences across the common or shared objectives of GCs, there are also differences in the scale and nature of the additional objectives. For example, METS Ignited has only four commercialisation-related objectives overall (all mentioned above), while AMGC has 17. While the presence of a core shared set of objectives is most important, the differences in the number of measures hint at the Performance Frameworks being used differently by the GCs. This creates issues when using the Performance Frameworks for evaluation.

The GCs with more objectives may be using their Performance Frameworks to set out operational objectives/milestones, rather than focusing on the shared goals of the IGCI. For example, AMGC includes the following objectives which appear to be more operational in nature:

- To what extent have manufacturing firms increased their ICT expenditure?
- To what extent have manufacturing firms increased their adoption of new operational processes?
- To what extent has AMGC helped improve AMGC participating firm's Technology Readiness Level (TRL).

While it is true that these objectives may be indicators of sectoral improvement (including the achievement of other IGCI objectives), their usage or relevance in a future potential evaluation is unclear, given than other GCs do not include this level of detail.

The Department should consider the extent to which these operational goals are important to sectoral growth and should be evaluated in the future.

There is some misclassification of questions in relation to outcomes. Examples related to commercialisation include AMGC's question: 'to what extent has AMGC helped AMGC participants knowledge on how to access capital' and FIAL's: 'to what extent have sector employment opportunities increased?'. Both questions could exist under the workforce outcome. This classification issue needs to be addressed so that future potential evaluations can appropriately attribute progress to the areas of the Evaluation Data Framework.

Measurement

Finally, even the measures that are broadly shared among the GCs are often measured in different ways. For example, the metrics used to measure improved collaboration include:

1. Number of connections from state director conversations
2. Number of connections made from projects
3. Proportion of firms exhibiting general collaboration (using a specific consultant's approach)
4. Number of connections made between firms and researchers, and proportion first time/new connection
5. Number of collaborative projects involving at least 1 company and 1 researcher
6. Number of incidences of firms sharing resources, research outcomes or capabilities
7. Number and demographic profile of Project Fund Agreements sought & signed up including cluster projects
8. Number of CRCs commenced/CRCPs funded/ARC/ITRP programs funded/ARC Linkage projects funded
9. Percentage of Australian university publications with international collaborations
10. Percentage of Australian inventions patented with international inventors/collaborators
11. Quantity of international sourced research funding secured by Australian Universities, start-ups, and SMEs
12. Measuring number of companies inbound/outbound trade missions (lead indicator)
13. Percentage of collaborative projects that foster industry and research collaboration.
14. Number of research organisations collaborating with industry on supported projects
15. Proportion of firms in GCs that are collaborating (BCS approach)
16. Proportion of firms collaborating with external entities
17. Sentiment on value of collaboration.

There is only one metric (metric 8) proposed by more than one GC. This metric is proposed by both AustCyber and METS Ignited, and is focused on inputs to collaboration, rather than the outcomes of collaboration.

C.4.3 Inter-program and inter-agency cooperation

Table C.5 provides the evidence base for the assessment on intra and inter-agency cooperation in Section 4.4. This list is illustrative of the breadth of cooperative relationships and is not exhaustive. It has been developed using information obtained through the desktop review and does not reflect subsequent input from stakeholder consultation and the surveys.

This section does not reflect any changes in cooperation that may arise from the announcement of the MMS in the 2020-21 Federal Budget.

Table C.5 Intra and inter-agency cooperation

GC	Program name	Collaborators	Aim and focus
All GCs **Engagement with broader stakeholders**	Project Fund	Industry Researchers and universities Government Industry associations	– $93 million in Department funding has been committed for collaborative projects to address sector wide opportunities or challenges – These require at least matched funding, building the scale of the potential outcomes.
	Cooperative Research Centres Program Cooperative Research Centres Industrial Transformation Research Program (ITRP) Research Hubs	The Department The Department of Education & Training ARC	– Coordinating, supporting development of, and reviewing proposals – Adding value and facilitating connections over the life of a project – Aligning proposals to the GC's key themes and Industry Knowledge Priorities, which informs researchers of industry needs, commercialisation opportunities and priorities and allows researchers to address priority industry gaps – New CRCs (post mid-2015) were expected to establish a formal relationship with the relevant GC (existing CRCs were to explore these opportunities) – Altering the ITRP funding roles to match the GCs – Facilitating connections with industry partners – Signing Memoranda of Understanding – e.g.: – AMGC: National Carbon Fibre Manufacturing Collaboration Hub and the National Additive Manufacturing Collaboration Hub – METS Ignited: CRC for Optimising Resource Extraction.
	Entrepreneurs' Programme	Department	– Insights from the EP inform the GCs long-term sector strategies – GCs co-design and deliver skills workshops with the EP, to ensure content meets firm needs. To 2019, 450 workshops were delivered to over 10,000 participants.[154]
	SME Export Hubs Austrade Landing Pads	Austrade Export Council of Australia	– Aim to provide advisory and promotional support, networking and international export opportunities – Trade delegations and missions, for example, supporting business participation in Tel Aviv, Singapore and San Francisco – Development of a 'Team Australia' presence, supporting over 900 organisations at 40 international trade shows and outbound trade missions, resulting in >150 firms securing their first export or expanding their sales – Deliver export readiness workshops – The GC cluster initiatives informed the design of the SME Export Hubs and support organisations to ensure local and national export strategies align.

[154] Department of Industry, Innovation and Science (2019). Op. cit.

GC	Program name	Collaborators	Aim and focus
	Accelerating Commercialisation Fund	AusIndustry (EP, Entrepreneurs' Infrastructure Programme)	– Co-fund high potential commercialisation opportunities (particularly for SMEs) and deliver programs aimed at improving business capability and commercial readiness – Aims to boost entrepreneurship and innovation.
	Priorities and roadmaps	CSIRO	– The GC knowledge priorities were originally intended to inform CSIRO's work – CSIRO furthered the IGCI objectives in its 2015-20 Strategy – AustCyber and CSIRO co-developed the Cyber Security Roadmap. The GCs wrote introductions for the remaining relevant Roadmaps – CSIRO was to take an active role in the IICA, establishing the GCs and aligning the CSIRO roadmaps with the SCPs. The vision for this alignment was unclear and the process challenging (the GCs and CSIRO business units do not easily match) – Alignment with individual GCs on sector-specific issues.
	Accelerator Programs, for example RISE Note: other GCs have been engaged in accelerator programs, including MTPConnect.	METS Ignited NERA KPMG Queensland Government WA Government	– METS Ignited and NERA cooperate with growth-stage SMEs who possess innovative solutions to priority challenges in the sector – Provide structure and support to develop a sustainable innovation ecosystem – Builds the skills required to commercialise technology solutions – 17 businesses from regional and metropolitan Queensland and Western Australia have graduated from the program.
	Industry Skills Fund	Then Department of Education & Training	– GCs did not initially seek advice for input into the SCPs – Better alignment could be achieved.
	Alignment with Vocational Education and Training (VET)	Australian Industry and Skills Committee Industry Reference Committees (IRCs)	GCs provide advice on the sector skills needs GC representatives sit on the following seven IRCs:[155] – Manufacturing and Engineering IRC (AMGC) – Sustainability IRC (AMGC) – Information and Communications Technology IRC (AustCyber) – Coal Mining IRC (METS Ignited and NERA) – Drilling IRC (METS Ignited and NERA) – Metalliferous Mining IRC (METS Ignited and NERA) – Pharmaceutical Manufacturing IRC (MTPConnect).
	Trade Barriers Register	Export Council of Australia All GCs	– Supporting the development of the Register – Provides a platform to report barriers to doing business overseas\ – Build government's understanding of the challenges faced by international businesses and how to prioritise responses – A beta version of the register was launched in late 2018 – Initially launched by FIAL with support from AMGC.

[155] Ibid.

GC	Program name	Collaborators	Aim and focus
All GCs **Engagement between GCs**	Industry Mentoring Network in STEM (IMNIS) program	METS Ignited MTPConnect NERA KPMG	– GCs are supporting the national expansion of the program – Aims to prepare a new generation of diverse, inclusive and industry-ready PhD graduates – Matches PhD students with industry leaders across all the states and territories – Provides access to professional industry networks that support mentorship, exposure to industry-focused research and post-research employment opportunities.
	CORE Innovation Hub	METS Ignited NERA	– CORE is Australia's first co-working, collaboration and innovation hub focused on resources technology – Membership comprises 130 industry members – Reciprocal agreements are in place with other resources hubs in Santiago, San Francisco and Houston, broadening the scale and potential impact.
	Data61's Ribit platform	AustCyber FIAL MTPConnect	– Aims to connect students with digital, research and business skills to potential employers through events – Over 800 students have been connected to over 100 business and industry representatives – Delivers employment opportunities to participating students, with most participants having been interviewed or hired by attending businesses.
	Data61's Sixth Wave Alliance	Data61, CSIRO METS Ignited	– This is a cross sector initiative that aims to connect all the Industry 4.0 research and automation robotic initiatives across the sector.
	Industry 4.0 Advanced Manufacturing Forum	AMGC AustCyber MTPConnect	– Collectively, these GCs are represented on the national Industry 4.0 Advanced Manufacturing Forum (the successor to the Prime Minister's Industry 4.0 Taskforce) – Cyber resilience of medical devices and cyber security in advanced manufacturing – The 2018 MTAA conference featured a MTPConnect/AustCyber panel on cyber security in medical devices – AMGC is a member of the Forum – AustCyber is the Australian stream lead for cyber resilience.
	Market Insights & Information Portal	FIAL Other GCs	– Centralises information to facilitate collaboration, with the potential to include machine learning into the current portal.
AMGC	Advanced Manufacturing Early Stage Research Fund	Department	AMGC delivers the AMESRF, an industry-research collaboration initiative, on behalf of the Department Provides $1 million to eligible projects each year until 2020–21.
	Industry 4.0 Testlab facility	Swinburne Advanced Manufacturing Precinct - Swinburne University of Technology Siemens Manufacturing Futures Research Institute	– Industrial software grant funding to digitalise its Factory of the Future – Focuses on linking physical and digital worlds into cyber-physical systems, enabling the evolution of new technologies – Aims to demonstrate Industry 4.0 methodologies and practices, with a focus on the defence sector, and relevance to space, mining, electronics, food and agriculture, and automotive industries – Focuses on engagement with SMEs to provide otherwise unattainable access to smart factory technologies.

GC	Program name	Collaborators	Aim and focus
	Innovative Manufacturing CRC	Numerous industry, industry association, research organisation and government partners MTPConnect	– The direction for the CRC and future research projects is informed by the AMGC Knowledge Priorities – Supports Australian companies to increase their global relevance and competitiveness through research-led innovation in manufacturing products, processes and services.
	Virtual Shipyard Program	Centre for Defence Industry Capability SA Government Dassault Systems	– Training 14 South Australian companies using Industry 4.0 principles – Supports companies to collaborate, plan, design and build in 3D virtual environments – Aims to build capability and recruit more local firms into the supply chain of global defence primes, including by advising them on how to comply with cybersecurity requirements.
	National Carbon Fibre Manufacturing Collaboration Hub	Deakin University CSIRO Fibres of the Future Laboratory	– Supports industry-researcher joint projects on carbon fibre, advanced fibre and composite manufacturing – Aim to improve Australia's technology leadership and competitiveness by – Aims to reduce energy consumption, improve carbon fibre recycling, and generate new products and processes for automotive and defence industries, new industrial applications for carbon fibre.
	National Additive Manufacturing Collaboration Hub	CSIRO's Lab 22 Monash University	– Aims to support the development of a competitive carbon composite fender for the European automotive market, generate export revenue and increase in demand for high-value jobs in the Geelong area.
	TAFE program	NSW Government	– AMGC research is being used to refocus a NSW TAFE program, and skills and training initiatives.
AustCyber	Regulatory reform	MITRE Corporation (US federally funded Research and Development Center)	– Collaborative focus on better aligning Australian regulatory frameworks with international best practice standards and guidelines – Aims to streamline access to international markets.
	Cyber Security Innovation Nodes	Six states and territories	– Aim to drive collaboration and innovation in the sector – The nodes commit to national priorities defined in the AustCyber business strategy and SCP.
	Policy and program areas	Department of Home Affairs Australian Signals Directorate	AustCyber works with these agencies on a range of policy and program areas.
	Cyber security strategies	SA NSW	AustCyber has supported the development of three state cyber security strategies and advised others.
	Cyber Security Research Centre (the Cyber Security CRC)	Cyber Security Research Centre	– AustCyber holds an ex officio position on the CRC Board and supports alignment between the CRC's research agenda and the SCP's knowledge priorities – AustCyber has partnerships with at least four CRCs.

GC	Program name	Collaborators	Aim and focus
FIAL	Food Innovation Centre	CSIRO	FIAL is headquartered at the CSIRO Food Innovation Centre to drive collaboration and cooperation.
	Cluster Program	Numerous	Encourages: – connectivity and collaboration across businesses in the regions and cities by providing a platform for industry, government, and researchers to work towards a common goal – alignment with public agencies and other institutions – accelerated innovation and growth.
	National Food Waste Strategy	Australian Government Industry	Supports the delivery of the national priority to halve Australia's food waste by 2030 and the global action on reducing food waste by aligning with the United Nation's Sustainable Development Goal 12: ensure sustainable consumption and production patterns.
	Australian Food Catalogue	WA, NSW, VIC governments Austrade	– Aims to champion and drive usage of both Australian export ready suppliers and international buyers – Currently WA, NSW and VIC have agreed to use the tool; and Austrade has agreed to endorse all international buyers.
	Enterprise Solutions Centre Program	VIC, SA and QLD Government agencies	– Connects companies to expertise, technical and/or research advice to find solutions to technical challenges – Competitive program with competitive funding – Aims to promote collaboration, sharing of skills and knowledge by encouraging consortium applications.
	Victorian Salt Reduction Innovation Grants Initiative	VicHealth	– FIAL administers the initiative and provides expert advice to support grant applications – Provides funding to support SMEs to reformulate their products to reduce the amount of salt, thus responding to shifts in the processed food market – This aims to make foods healthier – The initiative links with FIAL's Building Healthier Foods Platform, providing a fast and cost-effect pathway to connect food manufacturers with expert advice.
METS Ignited	METS Ignited	QLD Government Queensland University of Technology	– METS Ignited is headquartered at the Queensland University of Technology, aiming to facilitate close collaboration.
	Regional and national accelerator programs	KPMG	– The Igniting METS Accelerator pilot program aims to bring leading mining sector corporates together with start-ups and SMEs – Focuses on value propositions, pitching, capability development and communications.
	Masterclasses	EP Austmine	– These masterclasses have shifted in focus to a broader digitally assisted delivery scope, such as the Digital Business Workshops – These initiatives aim to help build local specialisations in areas of competitive strength and enhance business growth.
	Queensland Clustering Initiative – Digital and Data Analytics – Automation & Robotics – Tailings & Mine Affected Water	≈25 Associates >35 Associates in the US and Canada, global partners and network of technology researchers >30 industry stakeholders	– Aims to find collaborative opportunities and strengthen the digital ecosystem to enable data and analytics to drive innovation and commercial opportunities. – Focuses on addressing operations challenges in engineering through teleoperation and automation solutions. This focuses on local industry using application-based research. – Aims to develop, promote and advance commercial solutions for global effected mine waters.

GC	Program name	Collaborators	Aim and focus
MTPConnect	BioMedTech Horizons (BMTH) Biomedical Translation Bridge (BTB) Researcher Exchange and Development within Industry (REDI)	DoH BioCurate, UniQuest and the Medical Device Partnering Program, Queensland University of Technology MedTech Actuator, IMNIS, ANDHealth The George Institute for Global Health Victorian Comprehensive Cancer Centre, APRIntern	– MTPConnect delivers several, programs via the Medical Research Future Fund (MRFF), valued at $99 million – BMTH aims to support innovative collaborative health technologies, drive discoveries towards proof-of-concept and commercialisation that address key health challenges and maximise entrepreneurship and idea potential – BTB aims to nurture the translation of new therapies, technologies and medical devices through to the proof of concept stage – REDI aims to leverage the expertise of research, training and industry partners to drive skills development and workforce training – For example, the BMTH has been used to stimulate commercialisation for precision medicine and 3D anatomical printing.
	Steering Committee for Adaptive Regulation of Digital Health	Therapeutic Goods Administration (TGA) CSIRO ANDHealth	– Ensuring regulations keep up with technological advancements – Aims to enable optimal roll out of major initiatives which regulate medical devices.
	Medtech and Biotech Mingle Melbourne	RMIT Advanced Manufacturing Precinct Ribit (CSIRO-Data61's student job platform)	Aims to foster collaboration and connect students with industry, including CSL, Cochlear, IBM, Telstra Health, and fast-growing companies such as Anatomics and MDI.
	Medical Devices Partnering Program	Medical Devices Research Institute (MDRI) Flinders University	MTPConnect has a Hub at the MDRI and provides funding for the Medical Devices Partnering Program, which aims to enhance collaboration to develop cutting-edge medical devices.
	SME Assist	TGA	The SME Assist web portal provides material to support firms and R&D groups to understand regulatory topics.
	Streamlining clinical trials regulation	Department TGA	Aims to enhance Australia's attractiveness in a global marketplace.
	WA MTPConnect Hub	WA Government University of Western Australia (UWA)	– Funding for 4 years to create a life science precinct and accelerate medical and biotechnologies – This aims to establish Western Australia as a world leader in this area.
NERA	Industry 4.0 ERDi Testlab	UWA Department AMIRA International, Enterprise Transformation Partners South Metropolitan TAFE	– Provides innovation support for SMEs through an open access facility – Aims to develop and demonstrate Standards-based, secure, interoperable process control and automation to accelerate the adoption of Industry 4.0 technologies in the energy and resource sectors.
	Australian Technical Committee	Standards Australia	– NERA has worked with to Standards Australia establish the Australian Technical Committee – Aims to influence the adoption of international standards in the oil and gas, energy and petrochemicals industries.

GC	Program name	Collaborators	Aim and focus
	Newcastle Institute for Energy and Resources	Australian Government and NSW Government funding Regional industry innovation network HunterNet METS Ignited (partnerships, Advisory Board) FIAL (Advisory Board)	– MOU with NERA on a coal site remediation project – Aims to drive improvements in productivity and sustainability through applied research and transformational solutions in sectors of national significance.
	Subsea Innovation Cluster Australia	Subsea Energy Australia 33 companies	– Focus addressing current and future challenges – Aims to foster cross industry collaboration to strengthen the competitiveness by developing differentiated products and services to realise sustainable growth and value creation regionally and globally.
	Western Australian activities	WA Government	Support for NERA's activities, particularly SME engagement, bridging industry and academia encouraging collaboration and promoting greater access to international markets.

Source: Growth Centre Snapshot, DISER 19 May 2020

Department of Industry, Innovation and Science (2018). Statement of Principles for Australian Innovation Precincts Place-Based Partnerships Building on Competitive Strengths. *Canberra: Australian Government.*

Office of the Chief Economist (2016). Industry Growth Centres Initiative Post-Commencement Evaluation. *Canberra: Australian Government.*

Department of Industry (2014). Industry Growth Centres Prospectus. Canberra: Australian Government.

C.5 GC participants

The specific limitations for how each GC records stakeholder interactions are captured in Table C.6. It has been developed using information obtained through the desktop review and does not reflect subsequent input from stakeholder consultation and the surveys.

Table C.6 Limitations in measuring GC interactions

GC	Specific limitations
AMGC	– Membership data: 730 unique and valid ABNs – When an organisation becomes a member, they are always a member – Data on workshops and meetings will be available in the future.
AustCyber	– List of ABNs they have interacted with, all of which have the same start (2018) and end date (2020) and interaction type and intensity level
FIAL	– Interactions data currently only available for 2015-16 – Data for 2016-17 to 2019-20 will be lack ABNs and will be cleaned and available in the future
METS Ignited	– Email recipients: the only IGC to record this interaction type
MTPConnect	– A new CRM was implemented in January 2018, which did not enable full migration of pre-September 2017 data (and all have a September 2017 'start date') – The 'start dates' were often absent, and the 'end date' was used instead – MTPConnect contracts third parties to provide services. The ABNs of those organisations receiving these services are unavailable – Individual CRM entries have not been created for each interaction with an entity. For example, all interactions with Monash University are captured as one entry. – 10 per cent of entries do not have ABNs, and are predominantly international companies or departments within universities identified elsewhere in the database

GC	Specific limitations
NERA	– Does not capture significant day to day engagement, including speaking engagements, panel sessions, presentations etc. – Emails sent to contacts are not recorded

Source: Business Intelligence and Reporting, Data Management and Analytics Branch (Data Branch), Analysis and Insights Division, Department of Industry, Science, Energy and Resources, 3 June 2020

The outcomes from participation and engagement are outlined in Table C.7. It has been developed using information obtained through the desktop review and does not reflect subsequent input from stakeholder consultation and the surveys.

Table C.7 Participation, engagement and concentration of outcomes

GC	Types of stakeholders engaged	Reach

AMGC	According to AMGC data,[156] AMGC's members are predominantly:
	– Manufacturing companies (73%), of these:
	  – the dominant sub-industries are engineering & computer design (34%), construction/furniture (21%), metals (primary & fabricated) (20%)
	  – 21% have more than one location in Australia
	  – 22% have one or more offices outside Australia
	  – 37% identify one or more advanced capabilities on their website
	– Small businesses (27% are 1-10 employees, 31% are 11-50 employees)
	– NSW-based (38%) and Victoria-based (24%)
	– Geographically dispersed.
		AMGC has held 238 events since its inception and reached an estimated 11,400 participants nationally.
		AMGC's state directors and senior staff have:
		– had 325 director level meetings with stakeholders to mid-2019
		– engaged 297 organisations
		– made 673 connections with industry leaders.
		Further, ≈210 firms have enrolled in the Manufacturing Academy.

AustCyber	According to Department data, AustCyber's stakeholders are predominantly: – Professional, scientific and technical services (68%) – Small businesses (55%, <20 FTEs) – More than 6 years old (73%) – Not involved in export (only 11% are exporting) – Exporting in the '$100,000 plus' export class (59%) – Located in NSW and Victoria.	– AustCyber education and training activities reached over 20,0000 students and 1,000 teachers in the first month – VET training packages, initially reached more than 2,000 students.
FIAL	According to Departmental data, FIAL's stakeholders are predominantly: – Manufacturing (33%) and professional, scientific and technical services (10%) – Small businesses (55%) – More than 6 years old (92%) – Not involved in export (only 33% are exporting) – Exporting in the '$100,000 plus' export class (73%) – Located in Victoria and NSW.	– 320 management programs conducted between 2017-18 and 2019-20 – 73 projects operating through FIAL's Enterprise Solutions Centre (81 per cent led by SMEs) – More than 1,500 attendees at information sessions and events from 2018-19 to 2019-20.
METS Ignited	According to information gathered from METS Ignited documentation, the largest number of METS Ignited events where held in Brisbane. This is not surprising given this is where the growth centre is located, and the support provided to centre by the Queensland Government. There is a relatively good distribution of events and attendees around the country. There is also a good mix of events in capital cities and regional towns. There was one event held overseas (in Chile).	METS Ignited activities have reached at least 3,700 participants through more than 140 roadshows, masterclasses, clusters, lectures, mentoring programs and accelerators. Further, METS Ignited has supported or reviewed over 90 CRC-P applications and 25 ARC ITRP applications.

[156] AMGC data was used in place of the Departments, where comparable information was available, due to the larger sample size available (1,200 members compared with 184).

GC	Types of stakeholders engaged	Reach
MTPConnect	We have not found any data available on MTPConnect's stakeholder profile. However, an assessment of MTPConnect's activities shows the breadth of engagement with organisations of all sizes, including industry, research organisations and universities, and government. MTPConnect is engaging stakeholders across all states.	– Project funds have been delivered to 142 industry partners – 242 collaboration events held with 13,746 attendees (to end 2018-19) – Led or directly supported 23 trade missions involving 850 companies – Connected with over 3,750 companies, universities, research organisations and industry associations – Workforce skills training provided to 2,230 individuals – 12,926 people have attended 896 MTPConnect-sponsored training events and seminars.
NERA	According to Department data, NERA's stakeholders are predominantly: – Professional, scientific and technical services (45%) – Small businesses (49%) – More than 6 years old (77%) – Not involved in export (only 29% are exporting) – Exporting in the '$100,000 plus' export class (80%) – Located in WA.	– SME and supply chain programs provide more than 40 businesses with one-on-one mentoring – 50 organisations have received Project Funding – Three collaborative clusters span industry and research and involve many partners

Note: experimental estimates based on the micro data from BLADE – available for AustCyber, FIAL, NERA.[157]

Source: AMGC-provided data, Office of the Chief Economist (2020). The impact of Industry Growth Centre participation on firm performance. *Canberra: Department of Industry, Science, Energy and Resources, Office of the Chief Economist.*

The GC models for self-sustaining post-government funding include securing fees through memberships; user pay activities, brokering fees and sponsorship. These are outlined in Table C.8. It has been developed using information obtained through the desktop review and does not reflect subsequent input from stakeholder consultation and the surveys, or the announcement of the MMS in the 2020-21 Federal Budget.

Table C.8 Models for self-sustaining and their feasibility

GC	Funding model	Feasibility of sustainability
AMGC	AMGC originally proposed a membership model targeted to industry stakeholders of varying size and capability. Each would contribute a different amount to the GC per annum and receive differing access to intellectual property and research outcomes generated through the GC. In their business case, AMGC indicated it was considering supplementing its funding base through: – fees for services (provision of advice and expertise) – fees for use of the online communications platform – fees for attending networking events – introducing intellectual property licensing – state based funding.	Identified as a key risk. Business case strongly recommends continued government funding.

[157] Office of the Chief Economist (2020). Op. cit.

GC	Funding model	Feasibility of sustainability
AustCyber	– Leveraging other government funding sources – Securing in-kind contributions – Strategic partnerships/sponsorships – Annual conferences (attendees pay) – Workshops and dinner functions – Fees to access network participants e.g. buyers.	Moderate risk of failing to secure the contributions required to support the GC. The business case indicates the need to move to a mixed mode of publicly and privately sourced funding
FIAL	FIAL originally proposed options for a membership model focused on the size of each network. This was updated in the business case to comprise: – A government fee to cover the cost of personnel to deliver the public good elements of FIAL's activities – Income obtained from the delivery of programs and initiatives to industry (stakeholders pay to participate) – Grants for the delivery of specific projects from state and territory agencies, and other funding sources	While sustainability was initially deemed possible FIAL indicated preference for the continuation of shared responsibility and ownership between industry and government. FIAL noted the challenge of getting Founding Members to pay their establishment fee. A larger membership fee would be more challenging. Business case indicates that a degree of government support is required long-term.
METS Ignited	METS Ignited's business case advocates for a mixed funding model, with: – self-funded programs of work – government or research funding of policy initiatives – industry funding of broad programs – user-pay activities to maintain key programs (e.g. conferences, workshops, seminars, fees to access databases and reports).	Continuing following the initial 4-year funding period on a self-sustaining basis. The business case indicates the need for some direct Australian Government funding to maintain an industry-independent role for the GC.
MTPConnect	– Australian Government (partial) and state funding – Membership – Fee-for-service: market research, access to tools and guides, brokering introductions and services – Education and events – Program funding – Equity & royalties.	MTPConnect expressed confidence that the GC would be self-sufficient by 2019, and identified it as a possible risk, with major consequences. MTPConnect indicated in the business case that they have undertaken steps to diversify their revenue. The additional two years of funding were identified as essential to transition to sustainability. Government funding to 2025 (i.e. a 10-year term) with a staggered reduction in funds year-on-year may be required to achieve full financial independence

GC	Funding model	Feasibility of sustainability
NERA	Originally, NERA planned to implement a user pay system and/or paid subscription fee. This was updated in the 2018 Business Case to: – grants from state, territory and federal governments – non-binding industry funds/fee for service – project contributions including management levy – fees for brokering introductions and services – obtaining an 'Approved Body' status under Austrade's Export Market Development Grant process.	Moderate likelihood that the GC is not self-funding in 4 years. Membership models can create incentives to focus on members or the highest paying members, rather than the whole industry NERA could be seen as in competition with people and organisations in the sector. In the 2018 Business Case, NERA indicated they were fulfilling a role for industry that could provide the basis for alternative sources of funding: – direct industry funding for a Decommissioning Program Director to act as the independent broker between industry's research needs/questions and an independent science panel – funding to establish a NERA Regional Operators Cluster.

Source: GC application forms, GC business cases for additional two years of funding.

The IGCI'S International Comparators

D

This Appendix provides detailed analysis of the international comparators.

While there are a number of similar initiatives in other countries, three were selected for comparison with the IGCI:

— Catapult Networks (United Kingdom)
— Topsectors (Netherlands)
— Strategic Innovation Programmes (Sweden).

The IGCI was compared against the Catapult Networks, Topsectors and Strategic Innovation Programmes, focusing on the overarching initiative's:

— logical framework
— main coordination structure characteristics
— implemented actions
— evaluation findings available to date, as relevant to the IGCI Evaluation elements.

This comparison aimed to better understand how certain policy choices relate to outcomes.

D.1 Context and background

The Catapult Networks, Topsectors and Strategic Innovation Programmes were chosen for comparison with the IGCI because they are most closely related to the IGCI.

D.1.1 Catapult Networks

The United Kingdom's Catapult Network is a network of nine world-leading technology centres. The Catapults aim to transform the capability for innovation in areas of strength and drive innovation to promote productivity and economic growth.[158]

Initially established in 2010 as a five-year program (2011-15), the Catapults are now seen as a long-term support for innovation across the UK. The Catapults connect businesses of all sizes with research and academic communities to share expertise, equipment, and other resources. The participants aim to progress late-stage research and development into new products and services and accelerate their adoption.

The Catapults are not-for-profit, independent, physical centres with a national presence in 30 locations around the United Kingdom. They each focus on a specific area of technology and expertise:[159]

— Cell and Gene Therapy
— Compound Semiconductor Applications

[158] Catapult (2020). *The Catapult Network*. Accessed 6 April 2020: https://catapult.org.uk/.

[159] Catapult (2020). *About Catapult*. Accessed 6 April 2020: https://catapult.org.uk/about-us/about-catapult/.

— Connected Places
— Digital
— Energy Systems
— High Value Manufacturing (a network of another seven centres)
— Medicines Discovery
— Offshore Renewable Energy
— Satellite Applications.

D.1.2 Topsectors

The Netherlands Government launched its Enterprise Policy, designed to increase the competitiveness of the economy in 2010.[160] The Topsectors approach was a central component of this policy, designed to further strengthen sectors with a solid knowledge base, a strong market and export position, and close collaboration between entrepreneurs and knowledge institutes. The nine sectors were selected based on their potential to contribute to solving societal challenges. The Topsectors are:[161]

— Horticulture and propagation materials
— Agri-food
— Water
— Life sciences and health
— Chemicals
— High tech
— Energy
— Logistics
— Creative industries.

Topteams were assembled for each key sector, comprising participants from the private sector, universities and research centres, and government. The Topteams defined the sectoral challenges, key priorities, and strategic direction required for the sector in submissions to government. The Topsectors were selected from these Topteams. Three cross-over domains were added to strengthen the cross-sectoral approach: ICT, bio-based economy and nanotechnology.[162] The ongoing strategic direction of the Topsectors is guided by the Topsector Alliance for Knowledge and Innovation (TKI). TKI investigates approaches for progressing innovative products or services to market.

The approach is demand-driven, relying on funding from Public Private Partnerships between industry, scientists and businesses to create research projects and address challenges. The contracts signed for 2020 have over 40 per cent of R&D funding set to be provided by the private sector, with the remainder coming from knowledge institutes and government.[163] While this industry contribution is significant, the Topsector approach as a whole is not expected to be revenue neutral or positive for the Netherlands Government. Subsidies such as the TKI surcharge and the MIT allowance are net costs for the government and are not expected to generate direct returns for the program.

[160] Verhagen, M. (2011). *To the Top Towards a new enterprise policy*. Netherlands: Ministry of Economic Affairs, Agriculture and Innovation.

[161] Government of the Netherlands (n.d.). *Encouraging innovation*. Accessed 20 April 2020: https://www.government.nl/topics/enterprise-and-innovation/encouraging-innovation.

[162] OECD (2014). *OECD Reviews of Innovation Policy: Netherlands 2014*. Paris: OECD.

[163] Topsectoren (2019) *Companies, knowledge institutions and government invest 4.9 billion in innovation*. Accessed 17 April 2020: https://www.topsectoren.nl/actueel/nieuws/2019/november/12-11-19/kic-investering-4-9-miljard.

D.1.3 Strategic Innovation Programmes

The Strategic Innovation Programmes (SIPs) are the result of an evolution in Swedish innovation policy over the 1990s and 2000s. The SIPs are designed to increase collaboration between industry and knowledge institutions, with the aim of increasing international competitiveness and helping to solve societal issues. The programmes are system based, and are a move away from the geographic and industry-based approaches of earlier years.[164] The current Strategic Innovation Programmes are:

- BioInnovation
- Drive Sweden
- Sio Grafen (graphene)
- Strim (mining)
- Lightweight
- Medtech4Health
- Metallic Material
- Process industrial IT and automation
- Production 2030
- Internet of Things
- InfraSweden 2030
- RE:Source
- Smarter electronic systems
- SWElife
- Smart Built Environment
- Innovair
- Viable Cities

The SIPs are created on the back of Strategic Innovation Agendas (SIAs). SIAs are formed when VINNOVA, Sweden's Innovation Agency, calls for submissions of agendas, or proposals. Agendas are submitted to VINNOVA for approval. Many overlapping agendas are consolidated, and VINNOVA approves several agendas. The agendas form the basis of the SIPs. SIPs are formed with a Board, which selects projects to fund. These projects must be approved by VINNOVA, which allocates public funding. VINNOVA and the Swedish research council, Formas, jointly finance the SIPs, with matched funding by participating companies.

D.2 Funding

The funding models of the comparators vary, although they all seek to mix private and public funding sources. The Catapults and Topsectors both have access to further conditional or competitive government funding streams, while SIPs rely on the funds from VINNOVA.

The funding provided by government and industry are outlined in Table D.1. The table excludes funding to be provided under the MMS, which includes $30 million to support AMGC over two years from 2020-21 and $20 million to support FIAL, METS Ignited and MTPConnect operating and administration costs for 2021-22.

Table D.1 shows that Comparatively, the IGCI has received more funding than the SIPs and less funding than the Catapults and Topsectors. This may be explained in part by the narrower focus and scale of the SIPs. None of the comparators are expected to become self-sufficient.

[164] Grillitsch M, Coenen L, et al (2019) Innovation policy for system-wide transformation: The case of Strategic Innovations Programmes (SIPs) in Sweden. *Research Policy* 48.

The Catapults aim to be funded in roughly equal parts by:

— R&D contracts, funded by business or independently

— collaborative applied R&D projects (competitive), funded jointly by the public and private sectors

— core public funding underpins long-term investment to support the development of infrastructure, expertise, and skills.

A 2017 review of the Catapults found that they have not achieved their funding model expectations and remain reliant on public funding.[165] Government funding was seen to provide value in enabling the Catapults to be neutral and trusted across industry.

The Topsectors are demand driven and rely on funding from Public Private Partnerships (PPPs). The Netherlands Government has gradually shifted responsibility for financing and demand-side management of public sector support for business research to the Topsectors. Approximately 40 per cent of Topsector R&D funding is expected to be provided by the private sector, with the remainder to be sourced from research institutes and other government programs.

The SIPs have been funded primarily through VINNOVA (Sweden's Innovation Agency) and Formas (the Swedish Research Council). Matching project funding is provided by participating companies. The SIPs have been reviewed on a 3-yearly basis and can receive a maximum of three funding renewals.

Across the Catapults, Topsectors and SIPs, continued government funding, at least in part, is seen as essential for maintaining effective operations of the initiatives. This has an important role in ensuring the initiatives are independent and trusted.

Table D.1 Funding and self-sufficiency

Program	Total funding	Funding sources	Self-sufficiency
IGCI	Government: $255 million Industry: $268 million	Government, industry, and knowledge institution funding leveraged through the Project Fund and other contributions	Originally proposed to be self-funding after four years.
Catapult Network	Government: £960 million (AU$1.75 billion) over 5 years[166] Industry: unknown	Government, industry	No
Topsectors	Government: €2.85 billion (AU$4.6 billion) in 2020. This includes many other funding streams accessed by the Topsectors. Industry: €2.05 billion (AU$3.3 billion) in 2020[167]	Government, industry, knowledge institutions	No
SIPs	Government: 430 million kroner ($67 million AUD)[168] Industry: unknown	Government, industry, knowledge institutions	No

Source: ACIL Allen Consulting 2020

[165] Ibid.

[166] Catapult Network (2018). *UK Government Grants Catapult Network £780M in Additional Funding.* Accessed 15 June 2020: https://ct.catapult.org.uk/news-media/general-news/uk-government-grants-catapult-network-%C2%A3780m-additional-funding

[167] Topsectoren (2019) *Companies, knowledge institutions and government invest 4.9 billion in innovation.* Accessed 17 April 2020: https://www.topsectoren.nl/actueel/nieuws/2019/november/12-11-19/kic-investering-4-9-miljard.

[168] OECD (2016). Op. cit.

D.3 Logical framework

Similar to the IGCI, the three comparators are all industry-led, government-supported initiatives. The design consists of an overarching framework, supported by government, under which sit several industry-led independent, private, not for profit companies. The design of all four initiatives aims to drive innovation, coordination and collaboration across business, knowledge institutions and government. The companies are expected to be agile, responsive, and flexible, driven by a commercial mind-set. They all aim to address market and system failures, including research-industry-government coordination problems and information asymmetries, and the significant gap between research findings and commercial outcomes.

The Topsectors and SIPs were originally designed as long-term strategic approaches to innovation policy. The Catapults were originally established as a 5-year program and are now seen as a long-term support mechanism for innovation in the UK.

The comparators take different approaches to driving innovation:

— Catapults focus on nine specific areas of technology and expertise

— Topsectors focus on nine sectors, with the addition of three cross-over domains made over time to strengthen the cross-sectoral approach

— SIPs focus on 17 systems and represent a move away from previous geographic and industry-based approaches.

There are strong similarities across the four initiatives. Given the recognised need for a longer-term, strategic approach to innovation internationally, it is generally recognised that short-term initiatives will not achieve the changes required to address the underlying challenges.

Table D.2 summarises the LFA of the international models.

Table D.2 Comparator logical framework components

LFA elements	Catapult Networks	Topsectors	Strategic Innovation Programmes
Sectoral issues and challenges	As highlighted in the 2010 report, *The Current and Future Role of Technology & Innovation Centres in the UK*,[169] the UK saw the need to close the significant gap between research findings and commercial propositions. Businesses lack the resources, expertise, equipment or contacts to develop research ideas into new products and services. The Catapults aim to bridge that gap. The Catapults were established to address market and system failures: – Uncertainty around return on investment and associated lag time creates low appetite for investing in R&D. – Positive externalities are not factored into firms' R&D decisions, so investment is lower without public support, and tends to be more closed. – Natural monopoly effects mean that necessary equipment can be large and expensive (particularly SMEs).	The Netherlands Government launched their Enterprise Policy in 2010, including the Topsector approach, designed to increase the competitiveness of the economy.[170] Topsectors were designed to address coordination problems and information asymmetries by encouraging companies, knowledge institutions, and government to work together.	The SIP/SIAs formed a core part of VINNOVA'S innovation policy from 2012 onwards. The SIPs were established to create the conditions necessary for international competitiveness and to find sustainable solutions to societal challenges. Specifically, the SIPs aim to coordinate R&D spending between government, academia, and industry.

[169] Hauser, H. (2010). *The Current and Future Role of Technology and Innovation Centres in the UK*: UK: Department for Business, Innovation and Skills.

[170] Dialogic (2017). Op. cit.

LFA elements	Catapult Networks	Topsectors	Strategic Innovation Programmes
	– Coordination failures between business, academia and/or government. – Initial lack of demand can inhibit potentially profitable R&D.		
Objectives	– Reduce the risk of innovation – Accelerate the pace of business development – Create sustainable jobs and growth – Develop the UK's skills and knowledge base and its global competitiveness.	– To support the Netherlands to be in the top five knowledge economies in the world by 2020[171] – Raise the Netherlands R&D to 2.5 per cent of GDP by 2020 – Increase co-ordination between industry, knowledge institutions and government – Increase competitiveness, particularly amongst new export markets (including Brazil, Russia, India and China nations) – Tackle social issues	– To design strategic, challenge-oriented innovation areas that have strong links with the research base – Lay the foundation for better collaboration between government, research and industry – Stimulate innovation by enhancing cooperation – Increase international competitiveness – Address grand social challenges
Participants	Businesses of any size, research institutes, government, investors, policy makers	Representatives from businesses in the selected Topsectors, knowledge institutions (universities, trade institutes), and government. Government plays a role in coordinating stakeholders, solving challenges with asymmetric information.	Business of any size, research institutes, and other organisations may all participate, with government setting the framework for assessing SIAs. Government does not participate directly in the programmes.
Activities	– Provision of cutting-edge R&D to industry[172] – Technology development: precompetitive R&D and systems integration; characterisation; translation – Developing human capital: vocational training; advanced R&D competency training; technical and operational manufacturing advisory services – Networking and sector development: dialogue with industry; developing standards and advising on regulatory frameworks and access to finance; coordinating R&D, providing co-working spaces for shared resources and access to expertise, working with individual companies (partnerships or consortia), working on government taskforces – Project funding delivered by Catapults, including large-scale, cross-sector collaborations – Expertise, insight and intelligence into policy	– Creations of Topteams which submit knowledge and innovation agendas along with a strategic plan. – Formation of Top consortia for Knowledge and Innovation, including industry, government representatives and knowledge institutions. – Creation of Public Private Partnerships (PPPs) with TKI and government – Funding provision, including support for SMEs (known as SME Innovation stimulation Topsectors, or MIT), and the TKI surcharge top-up of 25 per cent for every €1 firms spend on public-private research collaboration.	– VINNOVA provided seed funding to innovation actors to formulate SIA. – Submission of agendas to the government – Refinement of the agendas, with consolidation of similarly submitted agendas – Strategic Innovation Agendas (SIA) are formed – Proposals for SIP within the areas defined by the SIA are invited, and SIPs are created

[171] van der Wiel (2015) *Dutch Enterprise Policy: Topsector approach.* Netherlands: Ministry of Economic Affairs.

[172] Hauser, H. (2014). *Review of the Catapult network*. UK: Department for Business, Innovation and Skills.

LFA elements	Catapult Networks	Topsectors	Strategic Innovation Programmes
	– Supporting the sector to overcome systemic barriers – Targeting of issues which no single stakeholder can address individually		
Outcomes (short and long term)	Short term:[173] – Number of new businesses or spin outs created – Increased private R&D expenditure – Increased and accelerated translation of research into industry innovation Long term: – Value of IP income or from licenses – Business growth (increased sales or turnover) – Employment outcomes Impacts: – Increased sector growth / gross value added – Increased productivity and exports – Improved health and wider societal benefits – Economic growth, increased high-value employment	Short term: – Increased cooperation and collaboration, particularly in fragmented sectors – Increased private R&D expenditure – Decrease in subsidies to sectors – Strong project focus Long term: – Increased competitiveness – Increased export capacity – Reduction in red tape Impacts: – Increased innovation – Increased availability of finance – More highly skilled workforce and human capital – Reduction in red tape – Important contribution to solving societal challenges worldwide	Short term: – Increased cooperation and collaboration Long term: – Increased competitiveness Impacts: – Increased innovation – Important contribution to solving societal challenges worldwide

Source: ACIL Allen Consulting 2020, based on analysis of Catapult and Topsector documents

D.4 Coordination structures

Governance

The UK Catapults are individually governed by Boards. Innovate UK, the government funding body, has observer status on Catapult Boards, and does not have a role in Board appointments. A 2017 performance review[174] identified a clash between private and public sector culture, since the Catapults are asked to deliver for Government, report on performance and comply with government accounting rules.

The Topsectors are overseen by the Ministry of Economic Affairs. The Ministry's role has shifted over time from an inspector to a partner. The Top Consortia for Knowledge and Innovation provide oversight to ensure that joint research agendas within the Topsectors are realised.[175]

The governance of the SIPs is more complex. When an innovation area is selected (a process that involves advice from independent experts), those organisations involved nominating the area take on management responsibility for the SIP. However, VINNOVA[176] retains final say over which SIP activities are funded. Each SIP is managed by an external project coordinator and overseen by a Board of directors (often assisted by a VINNOVA appointed "agenda council").[177]

[173] Innovate UK (2017). *Catapult Programme: A Framework for Evaluating Impact*. UK: Department for Business, Energy and Industrial Strategy.

[174] Ernst & Young (2017). Op. cit.

[175] NOW (n.d.). NWO and the Top sectors. Accessed 14 June 2020: https://www.nwo.nl/en/policies/top+sectors.

[176] VINNOVA is the Swedish Governmental Agency for Innovation Systems.

[177] OECD (2016). Op. cit.

Identifying priorities

The focus areas for the IGCI were identified by government, while the priorities for each GC were identified by industry. This is broadly the same for the comparator programs.

Following the announcement of the MMS and funding extensions, the GCs will be tasked with supporting the implementation of the MMS in the immediate term and contributing to outcomes aligned with the National Manufacturing Priorities. The GCs will be asked to realign and refocus their activities to support delivery of the MMS. At the time of writing (November 2020), these changes were yet to be embedded.

The Catapult priority areas were identified through a call for public submissions by the House of Commons Science and Technology Committee. The Catapults were responsible for identifying the technology priorities relevant to their specific area.

The Catapults are strategically aligned with the UK's Industrial Strategy. However, a 2017 performance review found that there has been no single, commonly agreed purpose statement for Catapults. This was seen as resulting in inconsistent communication across the network and poor reflection of the purpose of the Catapults in their documents, from strategy and delivery plans to performance measurement and evaluation.[178]

The focus areas for the Topsectors were identified by Topteams which were assembled for each key sector. They comprised participants from the private sector, universities and research centres, and government. The Topteams defined the sectoral challenges, key priorities, and strategic direction required for the sector in submissions to government. The Topsectors took a demand-driven approach to identify their priorities, through Public Private Partnerships (PPPs).

The goals of the Topsector program (to increase R&D and competitiveness) are broad in nature. This is complemented by individual goal setting for research and innovation activities, which is driven by the Topsector Alliance for Knowledge and Innovation and by the Topteams.

The SIPs approach involves industry-led proposals that define the priority areas. This bottom-up process is facilitated by government nominated criteria including societal challenges, high scientific quality, collaboration, cross-disciplinary and co-financing. Government plays a role in influencing the number and composition of the SIPs, including encouraging the amalgamation of submissions where multiple proposals overlap or demonstrate potential for synergy. The objectives of the SIP agenda are broad: to create the conditions for international competitiveness and find sustainable solutions to societal challenges.

Table D.3 summarises the CSA of the international models.

Table D.3 Comparator Primary coordination structures

Primary coordination structures	Catapult Networks	Topsectors	Strategic Innovation Programmes
Information retrieval			
Process for identifying objectives (opportunities and bottlenecks)	The House of Commons Science and Technology Committee issued a public call in 2010 for submissions (85 received) on the value of the existing Technology and Innovation Centres in comparison with other models. The Committee conducted four panel discussions and a field trip to explore three German research and technology and innovation institutions.	The Ministry for Economic Affairs contracted Dialogic conduct an evaluation of the Topsector approach. A key evaluation question was "What bottlenecks do the Topsectors face when attempting to strengthen and transform their innovation systems.	VINNOVA runs a bottom-up process that allows innovation actors to define priority areas, with government facilitating the process and establishing a framework of selection criteria. The framework was expected to govern the choice of activities conducted within these areas, while the Board was responsible for proposing and managing the programme.

[178] Ernst & Young (2017). Op. cit.

Primary coordination structures	Catapult Networks	Topsectors	Strategic Innovation Programmes
Openness			
Process for communicating objectives	– Strategy and promotional materials – The Innovation Chanel on YouTube, LinkedIn and Twitter accounts – Publication of the Catapult Network through Innovate UK materials – Public events, webinars, conferences, seminars, workshops – Catapult-specific newsletters	– The www.topsectoren.nl website – Individual Topsector websites, such as topsectorenergie.nl – Media releases – Twitter	– Individual SIP websites – Media releases – Industry fairs, workshops
Process for ensuring broad and representative involvement in identifying objectives	Industry engagement to set the objectives of the work plan, balanced with the Catapults' expertise and unique position to observe, and target, the 'bigger picture' cross-sectoral challenges and goals that are needed to drive the direction of the sector. A prospectus was released in 2011 with the key principles for the Catapults. Some 500 public submissions were received on the prospectus. This was followed by a further House of Commons Science and Technology Committee inquiry in 2011 into the potential Catapult Network and proposed criteria to establish the Catapults: – Existence of potential global markets – World-leading research capability in the UK – Ability of businesses to develop technologies, increase investment, capture the value chain and embed the activity in the UK – Potential to attract and anchor globally mobile companies and secure sustainable wealth creation – Close alignment with national strategic priorities.	Industry representatives are at the centre of coordination (bottom-up approach). In 2011, firms and research institutes were given the opportunity to unite themselves in 'top teams', which were assessed by government. Topteams defined the objectives based on a review of the barriers and opportunities and discussions among stakeholders in the sector. The Topteams comprised participants from the private sector, universities and research centres, and government. The ongoing strategic direction of the Topsectors is guided by the Top Sector Alliance for Knowledge and Innovation (TKI).	Business and research institutions are involved at the Strategic Innovation Setting level. Any organisation can make submissions to this process. This ensures that those who wish to contribute to the agendas may. Overlapping submissions are encouraged to consolidate.
Types of stakeholders involved in setting objectives	Innovate UK (the UK's innovation agency, and part of the UK Research and Innovation organisation) selected the Catapults to complement the support provided to current priority program areas. The Catapults undertook sector engagement to identify sectoral issues and focus areas	Stakeholders included industry, private sector, universities, research institutions and government. Each Topsector defines the objectives for its sector.	While the framework for approving SIAs is designed and administered by VINNOVA, the agendas themselves are driven by participants, including universities and private companies. Within each SIP, the Agenda council proposes projects, which are then in turn assessed by VINNOVA.

Primary coordination structures	Catapult Networks	Topsectors	Strategic Innovation Programmes
Focus on change			
Processes in place to drive change and growth (focus on current practice/ development of new practices)	The Catapult Network has grown to include two additional Catapults (from seven to nine) since its commencement. The skills and facilities the Catapults have invested in are not fixed to one mode or moment in time, but designed to evolve. The network overall is poised to reconfigure according the challenges being faced.[179] The 2014 Hauser Review[180] noted it was important the Catapults maintain flexibility in budgets and approach to identify new Catapults, as taking advantage of scientific breakthroughs and opportunities may require faster responses than feasible through traditional processes. The review also noted that the network requires long-term government support to strengthen and expand capabilities.	The nine Topsectors were expanded with three cross-over domains to address cross-sectoral issues. Topsectors drive their own agendas to address the issues that matter to stakeholders. Each decide what innovation and human capital priorities are for the firms represented, and then every two years, Topteams sign agreements with authorities and other organisations as to what will be funded.	There have been several waves of SIA, which has expanded the current number of SIPs to 16. SIAs originally were focused on Sweden's traditional economic areas such as mining and manufacturing. However, they have expanded to include bio innovation, electronics, automation, and medtech. SIPs are reviewed on a 3-year basis, with a maximum of 3 funding renewals. This regular review process ensures only relevant SIAs and SIPs are continued. The cap on funding renewals promotes the creation of new SIAs.
Are processes aimed at firm-, sector- or system level changes	Among other points, the Catapults were selected in areas of high potential and tasked with undertaking collaborative applied projects and create a critical mass of activity between business and research institutes. This involves supporting individual businesses, developing cross-sector collaborations and gearing the system for the future.	The Topsectors approach is focused on sector level changes, while encouraging more cooperation throughout the system.	Grillitsch et al. describes the SIP as one that 'increasingly prioritizes system-wide changes'[181] by seeking to tackle societal challenges.
Leadership			
Process for ensuring involvement	Each Catapult is a company limited by guarantee, a separate legal entity from Innovate UK and independent from each other. They are controlled by their own Boards with an Executive Management team responsible for the day-to-day management of each Catapult.	Topteams are incentivised to participate through grants and surcharges, including the TKI-surcharge, which provides a 25 per cent top up for every €1 firms spend on public-private research. The MIT scheme encourages SMEs to participate.	Government funding is the primary incentive for organisations to participate. The OECD Report[182] argued that VINNOVA should investigate the communities being excluded from the SIA/SIP process.

[179] Catapult Network (2017). *Fostering Innovation to Drive Economic Growth*. UK: Innovate UK.

[180] Hauser, H. (2014). *Review of the Catapult Network.* UK: Department for Business, Innovation and Skills.

[181] Grillitsch M, Coenen L, et al (2019) *Innov*ation policy for system-wide transformation: The case of Strategic Innovations Programmes (SIPs) in Sweden. *Research Policy* 48.

[182] OECD (2016). Op. cit.

Primary coordination structures	Catapult Networks	Topsectors	Strategic Innovation Programmes
Processes to ensure delivery timetables were realistic / implemented	Innovate UK governance has not been sufficiently robust, particularly around financial and performance management.		Project plans are assessed by VINNOVA before approval.
Processes to ensure financial management was transparent, accurate and reliable	The funding model is appropriate, but needs more flexibility as the Catapults and sector mature and change.		
Outcome inclusivity			
Processes in place to ensure the GC's actions benefit non-participating firms	Local economic spill overs will occur as a result of locating centres across the country, including satellite locations. However, the design of the Catapults (targeting global markets by developing multi-application and disruptive technologies) means they are expected to have large positive spill over effects.	The demand-driven approach raises the risk that research results remain accessible only to firms participating to the TKI projects.[183]	
Processes in place to ensure the involved agencies can work together effectively	The 2017 EY review found limited evidence of extensive collaboration between Catapults. Cooperation between government agencies is less relevant in this model as Innovate UK is the umbrella body with responsibility for ensuring that its agencies work together. This is not a Catapult role.	The 2017 Dialogic review found evidence of greater collaboration, particularly amongst less-established industries.	Grillitsch et al. found that conflicting interests are not directly resolved. However, several SIPs set explicit measures for dismantling closed collaboration networks and silos. The authors describe a lack of ability to transcend the boundaries between academia and industry – primarily due to 'institutional mismatch,' such as different time horizons and different expectations for results. In seeking to achieve institutional change, the SIPs need additional support from VINNOVA and related state agencies and regulatory bodies.
Broad support			
Processes in place to support individual firms	In the UK, a number of large firms are located outside major cities. The Catapults are mostly located in cities. The Catapults appear to attract businesses of a range of sizes.		
Processes in place to support a wider range of actors	The Catapults are exploring ways to improve engagement of SMEs through regional centres of excellence; regionally led projects; and incubation deals / hackathons that may attract SMEs and micro businesses.	Measures like the MIT allowance are designed to encourage SMEs to participate.	

[183] Janssen, M. J. (2016) *What Bangs for Your Bucks? Assessing the Design and Impact of Transformative Policy*. USA: Centre for International Development at Harvard University.

Primary coordination structures	Catapult Networks	Topsectors	Strategic Innovation Programmes
Accountability			
Processes/ organisational structures in place to ensure outcomes	Performance management processes were limited, focused on too many KPIs (focused on inputs, not outcomes), and have not effectively guided the Catapults activities.	The 2017 Dialogic review found that the Topsectors approach led to increased demand-oriented research programming, with some Topsectors achieving relatively large impact from their efforts.	VINNOVA oversight of funding allocation, and the three-year reviews of each SIP are the primary mechanisms to ensure accountability in outcomes.
Accountabilities in place to ensure outcomes	Performance targets are in place, but the review indicated they were not being achieved. Only one Catapult met the 1/3, 1/3, 1/3 funding requirement, all others were heavily reliant on public funding, while other KPIs such as the collaborative research and development target and growth funding application targets were also undershot by a large portion of Catapults. The 2017 EY report found that performance targets were being reduced year-on-year, as they were not achieved. In general, the Catapults' strategies do not provide sufficient evidence that selected priorities / activities will address key market failures or maximise economic impacts. These are not completed with detailed execution plans.	However, the approach is weaker on transparency and accountability. The participants, responsibilities and objectives are unclear to participants and those outside the approach. The objectives are abstract and not suitable for monitoring or attribution.	
Adaptiveness			
Processes in place to modify strategies over time	The method of operation of each Catapult is designed to be adaptable to the needs of the specific sector.	Each TopTeam and TKI identifies the respective Topsector priorities for research and human capital annually, and can sign new PPPs biennially.	Reviews are conducted on a 3-year basis by VINNOVA. Each SIP has the flexibility to decide on projects on an ad hoc basis, allowing for a change of focus within an existing SIAs.
Processes for ensuring administrative efficiency	The 2017 EY review found the governance structures were not sufficiently robust.	The 2017 Dialogic review found that linking private and public investment was an efficient policy.	
Processes for ensuring accountable administration		The 2017 Dialogic review found limited evidence of accountable administration.	

Source: ACIL Allen Consulting 2020, various sources

D.5 Evaluation findings

Table D.4 draws from recent evaluations of the Catapult Networks,[184] Topsectors[185] and SIP[186,187] programs. A summary of each program is provided below.

Catapults

The 2017 performance review of the Catapults[188] found that the longer-established Catapults have successfully established themselves in their sectors, forming relationships with academia, SMEs, government, and industry, and generating commercial and R&D funding streams. Large facilities and cutting-edge technology have been developed and deployed and the international brand and reputation have grown, with other countries duplicating the Catapult model.

In 2019, nine years into operations, the Catapults had together achieved:[189]

— 12,379 industry collaborations, 2,260 academic collaborations

— over £1 billion (AU$1.8 billion) of research and demonstration facilities under management

— 491 international projects

— 4,389 SMEs supported

— 4,100 employees.

The 2017 performance review found that there was some evidence the Catapults have generated economic impact. However, impact up to the time of the review was not likely to be significant due to the lag time associated with achieving impact and the lack of clearly articulated objectives and framework for measuring impact. The Catapults have focussed much of their activities on larger companies, which are well equipped to engage with Catapults. The review identified some good examples of successful interactions with SMEs, yet in general, few SMEs are aware of, or interact with the Catapults.

The Catapults activities include providing advice on regulatory frameworks and standards and working on government taskforces. However, they have performed poorly on communicating with and involving government.[190] Of note, long-term core funding was identified as essential for the Catapults to address areas of high risk for individual companies, such as overcoming regulatory barriers.[191]

Outcomes from the Catapults are now emerging as they have now had time to build relationships, establish themselves in the sector and link in to commercial and other funding streams. Early success among some of the Catapults was attributed to strong leadership teams, which have been essential to driving progress.

Topsectors

The 2016[192] and 2017[193] reviews found that the Topsectors approach has been effective in shifting towards demand-oriented programming through PPPs, aligning human resources, engaging stakeholders in innovation activities and promoting export. Originally, the Topsectors did not place much emphasis on ground-breaking innovation. Rather, they

[184] Ernst & Young (2017). Op. cit.

[185] Dialogic (2017). Op. cit.

[186] Grillitsch M, Coenen L, et al (2019) Innovation policy for system-wide transformation: The case of Strategic Innovations Programmes (SIPs) in Sweden. *Research Policy* 48.

[187] OECD (2016). Op. cit.

[188] Ernst & Young (2017). Op. cit.

[189] Catapult Network (2019). *Supercharging business performance through innovation*. UK: Catapult Network.

[190] Ernst & Young (2017). Op. cit.

[191] Hauser, H. (2014). *Review of the Catapult network*. UK: Department for Business, Innovation and Skills.

[192] Janssen, M. J. (2016) *What Bangs for Your Bucks? Assessing the Design and Impact of Transformative Policy*. USA: Centre for International Development at Harvard University.

[193] Dialogic (2017). Op. cit.

focused on plans that were common across stakeholders' interests. More recent efforts have focused on expanding and connecting knowledge domains rather than simply enriching them.

The Topsectors have contributed to an increase in public and private funding. In 2020, companies, research institutes and Government Ministries will invest €4.9 billion (AU$8.0 billion) in knowledge and innovation. The private sector is contributing more than 40 per cent of this.[194]

Similar to the Catapults, the Topsectors have attracted greater participation from larger enterprises as these enterprises are more likely to seek new connections. However, the Topsectors do undertake activities to engage new, smaller businesses.

The Topsectors have achieved limited progress in overcoming regulatory barriers and establishing legitimacy. The Topsectors have not fully leveraged the industry-knowledge institutions-government design, and there has been limited government involvement in the Topsectors. Greater organisation according to sectoral visions might improve this involvement. [195]

Topsector are concentrated in sectors that were initially more fragmented. The gains have improved over time as the Topsector approach developed and relationships strengthened. Strong relationships across industry, research institutes, and government have been useful in tackling sector-wide innovation issues. Further, the Topsectors approach provides a platform to strengthen PPPs and to define and achieve shared goals.

SIPs

A 2016 OECD[196] review on innovation in Sweden found that, although it was too early to comment on the achievement of higher-level objectives, the SIPs were successfully stimulating innovative activities by enhancing collaboration across a diverse range of stakeholders in areas of strategic importance. Many SIPs had also developed innovation procurement capabilities. While originally concentrating on traditional Swedish industries, such as mining, later SIPs involved newer industries and technologies.

The SIPs secured an increase in funding between 2015 and again in 2016. In 2015,[197] 75 per cent of funds were concentrated in four research areas: mechanical engineering; materials technology; electrical engineering, electronics, and information technology; and other engineering.

A 2019 Grillitsch *et al*.[198] paper described key structural challenges to realising some objectives of the program. Silo-busting was reported to have been impeded by the structural differences between learning institutions and industry.

Grillitsch *et al*. noted that the SIPs require additional support from VINNOVA and related state agencies and regulatory bodies in order to achieve institutional change.

[194] Ibid.

[195] Dialogic (2017). Op. cit.

[196] OECD (2016). Op. cit.

[197] Ibid.

[198] Grillitsch M, Coenen L, et al (2019) Innovation policy for system-wide transformation: The case of Strategic Innovations Programmes (SIPs) in Sweden. *Research Policy* 48.

Table D.4 Alignment of comparator evaluation findings with IGCI evaluation elements

Evaluation element and sub-element	Catapult Networks	Topsectors	Strategic Innovation Programmes
Appropriateness			
Original rationale for the program	See *Sectoral issues and challenges* in Table D.2.		
Original rationale for government intervention	See *Sectoral issues and challenges* in Table D.2.		
Program design	The EY review found that the Catapults were established as independent, private companies to enable them to be: – be neutral across industry – be agile, responsive and flexible, driven by a commercial mind-set – attract talented leadership and highly qualified expert staff to support industry – be trusted with IP and commercially sensitive information – avoid the constraints and administrative costs faced by public organisations Catapults have not achieved their funding model expectations and they remain reliant on public funding. The 2014 Hauser review calls for long-term public support for the Catapults network to strengthen and expand capabilities.	Topsectors were established to increase coordination between the 'golden triangle' of business, knowledge institutions and government. The Topsectors policy design was found to be suitable for information exchange and cooperation between industry, research institutes and government. It provides a platform to: – strengthen the flow of information within/between government/industry – collective inputs prevent companies from appropriating public funds without contributing to innovation – the Netherlands Ministry of Economic Affairs gradually shifted responsibility for financing and demand-side management of public research to the Topsectors (acting more and more as a partner than a controller) – the cross-sectoral areas provide a valuable approach for explicitly focusing on solving social challenges	The SIP approach was designed to promote innovation on a system-wide level, as opposed to earlier Swedish policy which was industry and geographically ring-fenced. This approach sees agendas outlined and teams assembled aims to align the research and investment of educational institutions and industry – silo busting is a key priority for the SIPs. SIP programs are funded by VINNOVA. While there is some scope for collaboration outside of these funding structures, it is expected that a SIP that is not renewed with fresh funding will not continue to operate.
Persistency of alignment with strategic objectives	Catapults are strategically aligned with the Industrial Strategy[199], however, there has been no single, commonly agreed and consistently communicated purpose statement for Catapults that has been applied across the network and reflected from strategy through delivery plans to performance measurement and evaluation.	The objectives and targets of the Topsector approach are complemented by the goals of each TKI. The goals of the program (to increase R&D and competitiveness) are broad in nature. This is complemented by individual goal setting for research and innovation activities, which is driven by the TKIs and Topteams.	The goals of the SIP agenda are broad. The objectives are to create the conditions for international competitiveness and find sustainable solutions to societal challenges The selection of the SIPs and SIAs are in line with these objectives.

[199] HM Government (2017) *Industrial Strategy: Building a Britain fit for the future*. UK: HM Government.

Evaluation element and sub-element	Catapult Networks	Topsectors	Strategic Innovation Programmes
Efficiency			
Administration	Innovate UK governance has not been sufficiently robust, particularly around financial and performance management, with limited evidence of timely intervention regarding poor performance. Three centres were identified as needing performance plans, and potential funding suspension. Catapults with a chairperson with relevant business and industry experience performed more strongly than those that did not.	The 2017 Dialogic report identified governance was as an area for improvement for the program: – stakeholders not involved in the Topsectors did not know who was accountable – the objectives were too abstract, which prevented tracking and attribution of progress.	
Monitoring and evaluation / performance measurement	There was lack of consistency in the performance data reported, low transparency in the flow and use of funds and non-timely data availability. Evidence of poor governance, lack of cohesive strategy and poor financial and performance management.	The 2017 Dialogic review found that responsible ministries have been coordinating extensive monitoring procedures, however, the report also found that the objectives of the approach are abstract and not suitable for monitoring or attribution.	The 2016 OECD reported that the three-year review process aims to provide learning support for strategy development within SIPs. These should be revised to focus on regular impact assessment as a longer-term monitoring and evaluation mechanism.
Inter-agency cooperation	The longer-established Catapults successfully established themselves in their sectors, and formed relationships with academia, SMEs, Government and industry. There is limited collaboration between Catapults.	The approach provides a platform for parties to jointly organise their development and application of knowledge. In turn the coordination between participants has led to greater insight into Topsectors' activities.	The SIP approach funds collaborative efforts between research organisations and industry. SIAs with broad industry and academic backing are more likely to be approved by VINNOVA, incentivising inter-agency co-operation.
Effectiveness			
What is achieved?	The EY review found that each of the longer-established Catapults has been successful in setting up and establishing themselves in their sectors, forming relationships with academia, SMEs, Government and industry, and generating commercial and CR&D funding streams. Large facilities and cutting-edge technology have been successfully developed and deployed into the innovation network (e.g., the CGTC Stevenage facility) for exploitation within the Catapult sectors. The Catapult international brand and reputation has grown, with other countries now seeking to duplicate the Catapult model within their own geographies.	The approach has been effective in: – creating more demand-oriented programming of PPP research at the Netherlands knowledge institutes – aligning human capital activities – promoting export – engaging stakeholders in innovation activities. The Topsectors did not place much emphasis on ground-breaking innovation. Rather, they focused on plans that overlapped stakeholders' interests. More recent efforts have focused on expanding and connecting knowledge domains rather than just enriching them.	The OECD report found that the SIAs and SIPs had been successful in stimulating innovative activities by enhancing collaboration between innovation stakeholders. It was considered too early to comment on the effectiveness of the program at meeting its higher-level objectives.

Evaluation element and sub-element	Catapult Networks	Topsectors	Strategic Innovation Programmes
	Only the High Value Manufacturing Catapult achieved its funding targets. Others remained reliant on public funding.		
How much is achieved?	– 2,260 academic collaborations – 12,379 industry collaborations – Over £1 billion (AU$1.8 billion) of research and demonstration facilities under management – 491 international projects – 4,389 SMEs supported – 4,100 employees in 2019 There is some evidence the Catapults have generated economic impact, however, the lag time associated with achieving impact and the lack of clearly articulated objectives and framework for measuring impact, likely mean that the impact to date has not been significant.	Netherlands R&D funding has increased from below 2 per cent in 2011, to 2.17 per cent in 2018. However, this is below the goal of 2.5 per cent. In 2020, companies, knowledge institutions, and ministries will invest €4.9 billion (AU$8.0 billion) in knowledge and innovation. The private sector is contributing more than 40 per cent of this.	In 2016, approximately 430 million kr (AU$67 million) was spent across all SIAs, up from approximately 330 million kr (AU$51 million) in 2015.
Who is affected? / participation	Large companies are well equipped to engage with Catapults. While there are some good examples of successful interactions with SMEs, in general, few SMEs are aware of or interact with the Catapults. This could stem in part from the physical distance from the Catapults and lack of understanding of the potential value to be gained	Larger industries in the chosen Topsectors participate at a greater rate than smaller enterprises. The Topsectors undertake varying amounts of activities to bring new (small) players on Board. Larger companies are often already seeking new connections.	The original wave of SIAs was largely concentrated in traditional Swedish industries, such as mining. Later waves of SIAs involved more newer industries and technologies. According to 2015 OECD[200] data, 75% of funds were concentrated in four research areas: mechanical engineering, materials technology, electrical engineering, electronics, and information technology, and other engineering.
Where are the outcomes concentrated?	Among Catapults that have been operating for a longer timeframe (due to the lag time associated with achieving outcomes and impact) and among larger companies who are better equipped to engage with the Catapults.	The Topsector approach achieved greater gains in sectors that were initially more fragmented. Topsectors also achieved more gains as the approach developed and relationships strengthened.	Many SIPs developed innovation procurement capabilities.
How / why the outcomes are achieved?	Catapult international brand and reputation has grown. Time has enabled the Catapults to build relationships, establish themselves in the sector and link in to commercial and other funding streams. Strong leadership teams are essential to driving progress, those with weaker executive teams achieved less progress.	Strong relationships were built across industry, knowledge institutions, and government. These have been useful in tackling sector-wide innovation issues. The Topsectors approach provided a platform to strengthen PPP and define and achieve shared goals.	Grillitsch et al. describes key structural challenges to realising some objectives of the program. Silo-busting is impeded by the structural differences between learning institutions and industry.

[200] OECD (2016). Op. cit.

Evaluation element and sub-element	Catapult Networks	Topsectors	Strategic Innovation Programmes
Attribution of outcomes: counterfactual	Attribution was not determined in the EY review. This has been built into the Evaluation Framework[201] developed as a result of the EY review.	A counterfactual was not developed for either the Dialogic review or the Harvard review.	A counterfactual has not been conducted for the SIPs in either the OECD report, or the Grillitsch et al. paper.
Lessons			
Lessons learned	The concept of Catapults is sound and, when effectively implemented, can drive innovation and economic benefit. Implementation was inconsistent, which may have impacted on the impact of the program. Specifically, there has been: – no commonly agreed and consistently communicated purpose statement to guide strategy, delivery plans and performance measurement – insufficient financial and performance management governance from Innovate UK – limited performance management – low achievement of funding expectations and poor shift away from a reliance on public funding – limited collaboration between Catapults Catapults with a stronger focus on delivery plans to drive economic benefit achieved more economic impact. The overall impact of the Catapults is not likely to be significant so far. The EY report recommended that continued funding should be contingent on more robust governance.	A network approach cannot be implemented from one day to the next, and recent developments (such as more ambitious KIAs) have increased the approach's impact and potential. From the 2017 Dialogic Evaluation, the program could have been improved by: – developing more precise objectives, and building capacity to redefine these over time, as needed – contributing further efforts to address social issues – allowing for a flexible budget for Ministry spending for experiments – simplifying the governance structure – shifting the outcomes from knowledge development to promoting innovative entrepreneurship and creating a market for innovation. Topteams provided insight into the activities that each sector performs, and the stakeholders involved. This allows for opportunities to build cross-sectoral work. Relationships within Topsectors take time to develop. As they do, they can achieve better outcomes for cross-sectoral projects and larger objectives.	Grillitsch et al. found a range of challenges from their two SIP case studies. – Institutionally conflicting interests are not addressed in the program. – Shared visions are broad with a lack of concrete and actionable objectives – Narrowing down the scope of a SIP to encourage more actionable objectives would preclude the inclusion of a broader range of institutions and would limit blue-sky thinking and innovation.

Source: ACIL Allen Consulting 2020, various sources

[201] Innovate UK (2017). Op. cit.

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