

**Economic Impact Assessment:
AIC Innovation and Collaboration
Programs**
Australian Institute for Commercialisation

**Updated Final Report
December, 2010**

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Executive Summary

Background

The Australian Institute for Commercialisation (AIC) is a national organisation that works with entrepreneurs, businesses, research organisations, and governments to convert innovation into successful business outcomes.

Collaborations created through the AIC's program delivery are expected to result in significant contributions to the economy in the form of additional business turnover, value added activity, exports and employment each year.

With the increasing emphasis on government transparency surrounding R&D funding and accountability for the success of these programs, it is important to understand the magnitude of economic benefits resulting from the AIC's core programs.

Purpose of this Report

The objective of this research is to undertake an assessment of the overall economic impact of the delivery of three core AIC programs covering innovation and commercial collaboration activities. AIC programs for assessment include the TechFast®, Ideas2Market and TechClinic™ programs. These programs were chosen because they work with individuals, firms, and industry sectors respectively.

Ideas2Market, through its two distinct workshops, helps to provide information and skills to individuals looking to start a business, as well as existing businesses that are looking to grow and improve.

TechFast® actively facilitates businesses finding and establishing collaborations with other organisations, such as universities and research organisations, in order to solve product, process or service issues and access technical capability for new products or services so the firm can accelerate its growth.

TechClinics™ identify and facilitate, for an industry sector, the necessary steps required to develop innovative solutions to satisfy an industry market need, and facilitate interested parties to collaborate in such innovation by joining or creating new value chains.

Queensland was the initial focus for the research for these three programs, with TechFast® being the key program of study. Consultation was undertaken with Queensland program participating companies to understand the economic benefit of program delivery. Additional data from Victorian companies was then incorporated into the initial data set. These findings were then used to estimate economic impacts to the other TechFast® participating States of New South Wales, South Australia, Western Australia and Tasmania.

The AECgroup, an independent economic consultancy, was commissioned to undertake this research.

The Importance of Innovation and Commercialisation...

Achieving an innovative and a knowledge-based economy is one of the core pillars of economic development. Creation of a knowledge-based economy relies upon the innovation and then application of technologies in a commercial sense, to produce economic benefits and higher value adding jobs.

In a knowledge-based economy, innovation is not only an end-point, but a way of doing business that permeates everything a firm does. Achieving a knowledge-based and high value adding economy is a two-step process that relies upon both a creative step and the active commercialisation that follows.

Australia is well known for its innovative efforts relative to the size of its economy, ranking twelfth in the world for research & development expenditure as a percentage of GDP. However, high-technology exports from Australia are significantly lower than most developed countries in the world (as a proportion of R&D expenditure), highlighting that

although Australia is not underperforming in innovation, its slow rate of commercialisation is a key weakness in the development of a knowledge-based economy.

For Australia to achieve a competitive edge in the knowledge-based economy of the future, it is important that our creativity is actively coupled with commercialisation initiatives.

Programs like **TechFast®**, **Ideas2Market** and **TechClinics™** are important in assisting small and medium enterprises in establishing the links between creativity, innovation and commercialisation, thereby assisting the transition to a knowledge-based economy in Australia.

The AIC Innovation Catalyst & Associated Benefits...

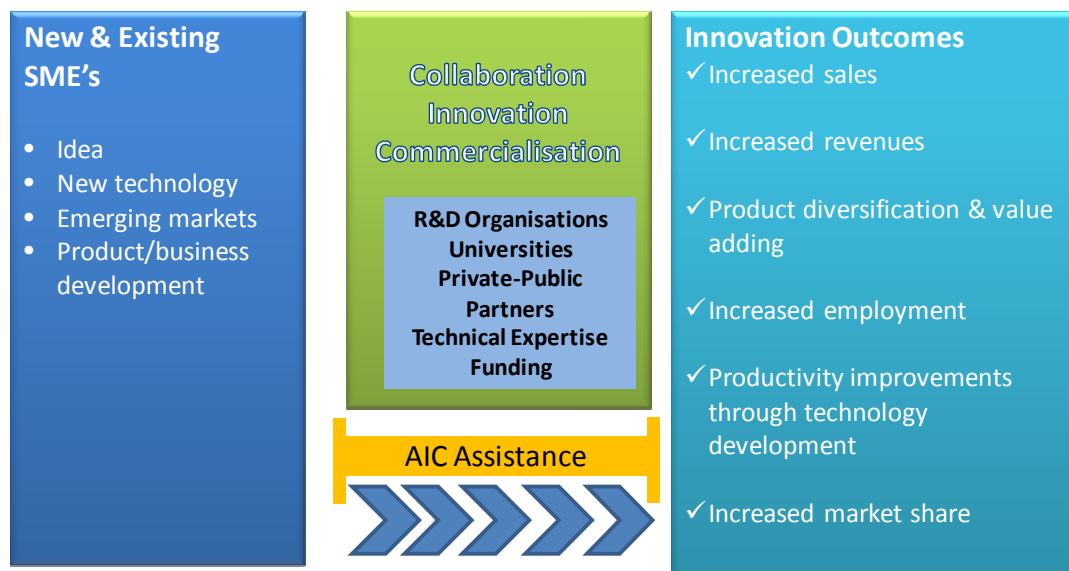
The AIC acts an effective innovation and commercialisation catalyst. The AIC does this by providing the knowledge and expertise to identify business and technology needs and facilitating initial collaborations with relevant research organisations, business partners and technical experts.

AIC activity assists business to establish new processes and collaborations, and effectively reach innovative and commercialisation outcomes in a fraction of the time, resulting in a number of positive outcomes to business and the economy.

These key outcomes can be measured across a range of performance-based indicators including increased sales, productivity improvements, employment, exports and market share, as well as a range of productivity benefits that would be experienced over time as staff with increased skills, experience and knowledge move between organisations and industries.

There are also a wide range of other non-quantifiable economic benefits in environmental, social and economic areas that result simply from the initiation of the innovation and technology process.

Figure E.1: The AIC Innovation-Commercialisation Catalyst



Source: AECgroup

Economic Contribution of AIC Programs...

This economic impact assessment of AIC programs found that the delivery of TechFast® and Ideas2Market programs in Australia over the past five years has proven successful in catalysing the innovation and commercialisation process.

Across Australia, the delivery of **TechFast®** is estimated to have resulted in an average annual economic benefit of:

- Increase in (direct) business output of between \$373,674 and \$934,186 per annum for each **TechFast®** business, resulting in a total (direct and indirect) increase of:
 - Between \$141.9 million and \$354.9 million in output;
 - Between \$58.2 million and \$145.4 million in value add;
 - Between \$34.5 million and \$86.2 million in income (wages and salaries); and
 - Between 433 and 1,107 FTE employees.

In Queensland, the delivery of AIC programs is estimated to have resulted in:

- Increase in (direct) business output of between \$244,000 and \$610,000 per annum for each **TechFast®** business, resulting in a total (direct and indirect) increase of:
 - Between \$26.1 million and \$65.2 million in output;
 - Between \$10.5 million and \$26.3 million in value add;
 - Between \$6.3 million and \$15.7 million in income (wages and salaries); and
 - Between 90 and 224 FTE employees.
- An increase of business output of approximately \$4,564 (direct) additional output per annum for the **Ideas2Market** program, resulting in a total (direct & indirect) increase of:
 - \$9.4 million in output;
 - \$4.3 million in value add;
 - \$2.4 million in income; and
 - 46 FTE employees.

In Queensland, program investment returns, as a proportion of program funding indicated that on average, annual program benefits for Ideas2Market and TechFast® programs ranged between \$11.40 and \$32.50 (average of low and high scenarios) for every program dollar spent, respectively.

Further, it was found that although the **TechClinic™** program is yet to see any economic returns as a result of its delivery, it could be expected that for the 177 Queensland participants to date, there is likely to be a future economic benefit of between \$3.4 million and \$9.6 million in additional (direct) output per year over the next five years.

Many businesses indicated that innovation followed by commercialisation would have been unlikely to occur without the facilitation of vital collaborations and advice provided through these AIC programs, or would have occurred at a significantly slower rate (and higher cost).

In summary, AEC concludes that the delivery of AIC programs, such as TechFast®, Ideas2Market and TechClinics™, provide valuable benefits to the Australian business community through the AIC's role as an innovation and commercialisation catalyst for small and medium enterprises.

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1. Introduction

1.1 Background

The Australian Institute of Commercialisation (AIC) is a national organisation that works with entrepreneurs, businesses, research organisations, and governments to convert innovation into successful business outcomes.

The AIC's **mission** is:

"To work with Australian industry, research organisations, and governments to create high value jobs, exports, and wealth by taking innovative ideas to market"

The AIC achieves this by establishing partnerships, improving skills (through delivery of a number of courses) and providing commercialisation advice, resulting in the delivery of invaluable services and advice to hundreds of businesses each year.

Collaborations created through program delivery are anticipated to be responsible for significant contributions to the economy in the form of additional business turnover, value added activity, exports and employment each year.

This report specifically focuses on the following AIC programs:

- **TechFast®:** TechFast® is one of the most successful programs delivered by the AIC and aims to assist small businesses nationally, across all industry sectors, to remain competitive though obtaining "that market edge". It does this by connecting the right business and research stakeholders together to:
 - Solve product, process or service issues;
 - Identify and access technical capability to fill internal gaps; and
 - Identify new growth opportunities for business.
- **Ideas2Market:** This program is delivered in two distinct workshops to cater for those looking to start up a business or progress an invention (workshop 1), and existing businesses that are looking to grow, improve and foster sustainability (workshop 2). Workshops are designed to provide a starting point or 'tool box' of core business essentials for business owners and managers of small business across all industry sectors.
- **TechClinic™:** TechClinics™ assist in the development of new industry sectors through targeted collaboration between research organisations, businesses, and customers along new industry value chains. TechClinic is the latest program to be delivered in Queensland.

1.2 Scope & Objectives

The objective of this research is to undertake an economic impact assessment of AIC programs covering core AIC innovation and commercial collaboration activities through its delivery of its flagship programs, such as TechFast®, Ideas2Market and TechClinic™.

While the focus of the study is the Queensland program benefits for each of the three nominated AIC programs, the TechFast® program findings have also been extended to the participating States of Victoria, New South Wales, Tasmania, Western Australia, South Australia.

Findings for the Ideas2Market and TechClinic programs are representative of Queensland economic benefits only.

1.3 Project Approach & Methodology

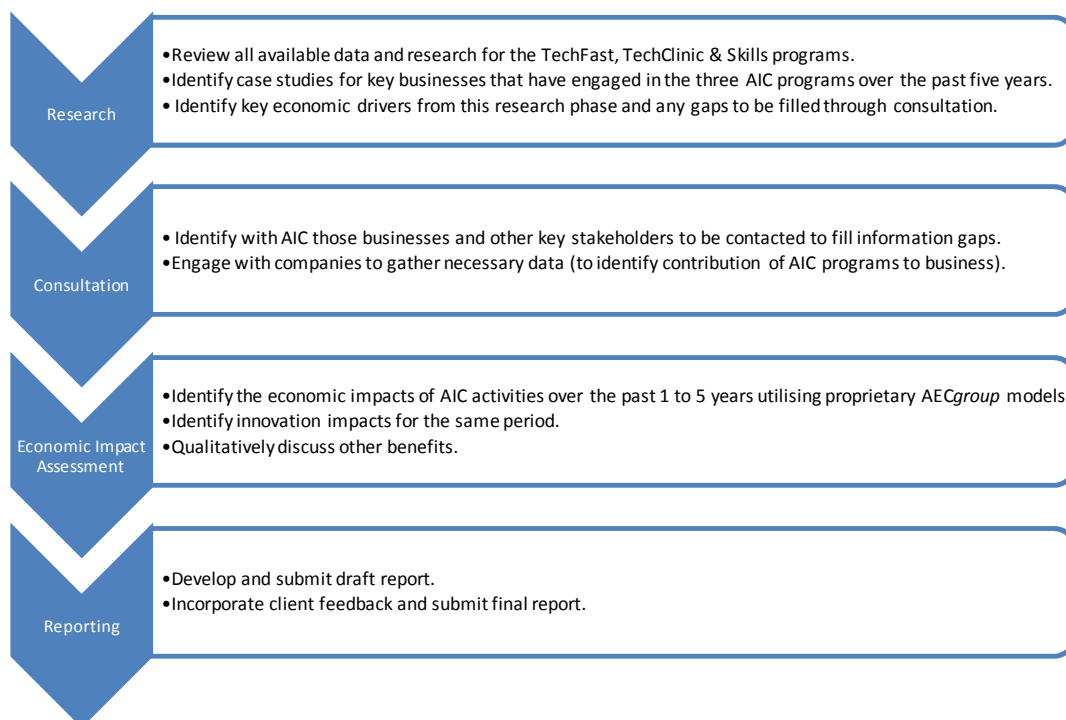
1.3.1 Approach

The following project approach (refer to Figure 1.1.) identified both qualitative and quantitative benefits of delivering AIC programs to the business community over the past five years.

For the programs of TechFast® and Ideas2Market, a number of core economic drivers were built from consultation with program participants and then modelled in an input-output framework, yielding an indicative economic impact of program participation.

For TechClinic™, a relatively new program in Queensland, the study focussed upon the qualitative benefits of successful innovative research outcomes delivered by the program.

Figure 1.1: Project Approach



1.3.2 Economic Impact Assessment Methodology

An input-output model was used to identify the direct and flow on economic impacts. The direct and indirect impacts to the Australian economy were assessed by using the following four measures:

- **Output:** Refers to the gross value of goods and services transacted, including the costs of goods and services used in the development and provision of the final product. The "Output" typically overstates the economic impacts as it counts all goods and services used in one stage of production as an input to later stages of production, hence counting their contribution more than once. Each AIC program Chapter details how the drivers of output were calculated;
- **Value added:** Refers to the value of output after deducting the cost of goods and services inputs in the production process. "Value added" defines the true net contribution and is subsequently the preferred measure for assessing economic impacts;
- **Income:** Measures the level of wages and salaries paid to employees of the industry under consideration and to other industries benefiting from the project; and
- **Employment:** Refers to the part-time and full-time employment positions generated by the economic stock, both directly and indirectly through flow-on activity, and is expressed in terms of full time equivalent (FTE) positions.




Additional detail regarding input-output analysis is provided in **Appendix A**.

The concepts of value added activity and output are often confused but can easily be explained via a simple example, illustrated in Table 1.1. The example below represents a simple economy that consists of mining, smelting and refining companies. The mine produces ore and sells it to the smelter. The smelter concentrates the ore into ingots and sells them to the refinery. The refinery in turn manufactures the ingots into a range of products and sells them overseas.

Output is represented by the total sales value (or revenues) from the direct sale of goods and services down the supply chain (e.g. \$175 is paid by the refinery to the smelter for concentrated ingot products).

Meanwhile, value-added is represented by the additional value that the product gains in each stage of the supply chain. For example, the smelter purchases ore for \$100 and sells ingots for \$175, indicating that the smelter has added \$75 in value by converting the metal ore into ingots.

Table 1.1. Output and Value-Add Example

	Mine	Smelter	Refinery	Total
				
Sales (Output)	100	175	275	550
Value-Added	100	75	100	275

2. Consultation Summary

A number of AIC program participating businesses were consulted to determine the qualitative and, where possible, the quantitative contribution of AIC programs to the various state and Australian economies. A full list of businesses and topics of discussion can be found in **Appendix B**.

2.1 Summary of Findings

A wide range of benefits have resulted from business participation in programs like TechFast® and Ideas2Market. These programs successfully:

- Provide companies with the relevant connections and collaborations required to launch their ideas.
- Instil in companies the confidence to take innovative ideas to market by providing 'in-touch' market advice and connecting business with industry development leaders, universities and researchers, who have the knowledge base to assist with commercialisation.
- Advise companies on how to obtain funding for innovation by providing knowledge of grants for which projects may be funded and advice on the process of application.
- Facilitate review of technologies to improve product enhancement in existing companies seeking to participate in product development.
- Provide intellectual property protection advice.

A number of financial and non-financial benefits also resulted from participation in AIC programs including:

Financial

- Successful application for grant money and R&D funding;
- Increased productivity;
- Input product replacement and value-adding; and
- Increased sales and revenues.

Non-Financial

- Environmental benefits, including emissions reductions, environmental management and waste treatment processes and renewable energy technology;
- Social benefits, including improvements in health and medical devices
- Product diversification and increased market share;
- Collaborations and partnerships; and
- Knowledge and understanding of markets and opportunities for complementary product alliances to be made.

Innovative product development benefits are often difficult to quantify with the full potential of technology developed often not understood until many years post R&D. This was evidenced by a number of companies having partaken in the program over the past two years, just reaching a point of commercialisation now. Many of these are certain to expect to draw increasing returns over the next five years as a result of product innovation and commercialisation catalysed by their participation in the AIC programs.

Most notable was the confidence that many businesses had in their AIC relationships and collaborations, with the majority indicating that the AIC was integral to the success of the commercialisation process and would be sought after for future business development advice.

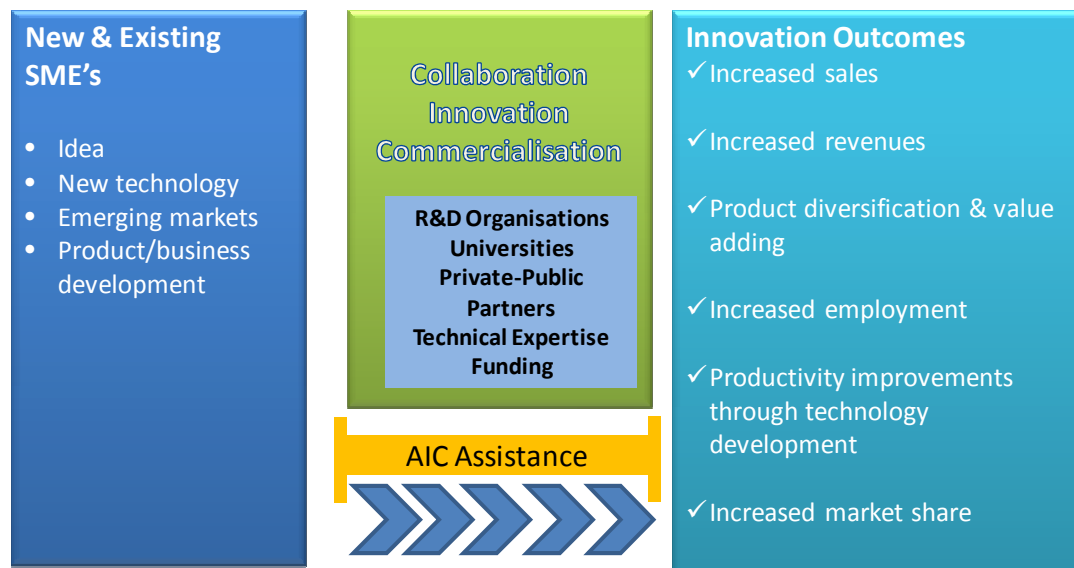
2.2 Implications

Consultation with key stakeholders revealed that many businesses engaged in AIC programs would not have commercialised ideas or diversified product lines without the assistance of the AIC to facilitate the initial collaborations with research organisations, business partners and technical experts.

A smaller proportion of organisations that already had some business development experience indicated that engagement with AIC greatly increased their rate of innovative product commercialisation than would have otherwise occurred. In some cases it was indicated that engagement with AIC sped up the entire innovative process by between 12 months to 2 years, just by connecting business with the right people and providing the mechanisms for their innovation to be established.

Overall, this implies that the AIC is an effective innovation and commercialisation catalyst and enabler. The result has been that businesses are now able to establish process and collaborations to effectively reach innovative and commercialisation outcomes in a fraction of the time, resulting in a number of positive innovative outcomes to business and the economy as shown in the figure below.

Figure 2.1: The AIC Innovation-Commercialisation Catalyst



Source: AECgroup

2.3 Case Studies

Below are a number of AIC program case studies which demonstrate the effectiveness of each program in delivering a number of direct business and economic benefits.

TechFast Program Case Study: Biolytix Innovative Wastewater Treatment Systems

Biolytix® is a Queensland based company that has developed innovative waste water technology that has been successfully exported to the United States of America (USA). The technology employs natural wastewater treatment systems that are targeted at markets which value sustainability and the environment. While uptake of the product has been successful in USA markets, there has been a lack of product confidence from New Zealand and Australian markets.

To overcome this perception Biolytix combined a variety of in-house technologies to create new solutions to decentralised sewerage which would be suitable for overcoming traditional perceptions held about decentralised sanitation systems.

TechFast® assisted in the investigation of suitable technologies for the wastewater treatment sector and connecting Biolytix with the appropriate research and industry contacts to reach these product solutions. The outcome was the development of

sophisticated telemetry systems and the BioWater network.

The development of the BioWater network has directly increased the potential of Biolytix in the global waste treatment market. Specific benefits resulting from the program include:

- Development of a competitive and high quality product resulting in:
 - Increased sales and revenues;
 - Increased market share;
 - Profitable return on R&D investments (greater than 5%); and
 - Increased exports;
- Broader environmental benefits resulting from adoption of waste-water treatment technology; and
- Increased contacts, collaborations and partnerships with R&D organisations and technical specialists, providing the opportunity for innovation and value-adding of products.

As a result of the success of the BioWater network, Biolytix intends to engage in additional R&D to assist product diversification and company growth in the future. The Biolytix experience with using TechFast® to assist in the product development and commercialisation process was a positive one, with the company expecting to seek the assistance of the AIC in the future to enhance its R&D commercialisation outcomes.

Ideas2Market Program Case Study: Lifehaler

Lifehaler Pty Ltd has designed and is currently in the process of commercialising an innovative waterproof asthma medication device (inhaler), which is due to be released to market at the end of 2010. This product is a waterproof and wearable asthma inhaler designed to allow for quick and easy administration of asthma medication for those engaging in water sports and activities.

Lifehaler initially started out as an idea for entrepreneur Michael Blanc, which he then progressed through various stages of concept, design and manufacture, finally reaching a point of commercialisation in 2010.

During this process, Michael Blanc participated in the Ideas2Market program (2 workshops). In the case of Lifehaler, the content of the workshops was not new. However, Ideas2Market did reinforce and refresh many aspects of the innovation-to-commercialisation process, as well as provide a forum for ideas sharing and meeting a range of people, ultimately providing important business connections and collaborations, particularly for a business in its fledgling stages.

Significant value was also gained from the real-life experiences of the speakers, particularly around the topics of marketing and seeking government grants and funding to assist in the innovation-commercialisation process. Even though the Lifehaler product is yet to be delivered to the market, Ideas2Market provided core advice on the requirements for achieving commercialisation.

TechClinic™ Program Case Study: Energy Storage Opportunities for Remote Off-Grid Solar & Wind Generation Projects

TechClinics™ provide the forum for researcher, technology providers, potential end-users of research and other key stakeholders such as regulators, government, investors and the members of the supply chain, to be brought together to explore opportunities for future market needs of specified markets.

This TechClinic™ was an initiative by the Enterprise Connect Clean Energy Innovation Centre (CEIC) to accelerate clean energy technology development and adoption in Australia. Industry projects highlighted in the forum included Horizon Power's Kalumbura and Yungngora community projects, Hydro Tasmania's King Island Project and Ergon Energy's Windorah and Thursday Island Projects.

50 energy experts (renewable and non-renewable) attended the clinic providing a forum for firm-to-firm business introductions and business leads.

As a result of the forum, collaboration along a new value chain between four of the companies in attendance was achieved. These stakeholders are currently engaged in exploring a collaborative project to meet Horizon Power's needs whilst also individually exploring wider opportunities for global energy solutions.

Benefits and outcomes of the Energy Opportunities TechClinic™ include:

- Identification of new energy market opportunities and increased access to emerging markets;
- Increased collaboration between the public and private sector;
- Increased innovation and technology development and adoption by industry;
- Promotion of new industry value chains & networks;
- Establishment of major (large businesses & organisations) and sub-major (small & medium enterprise) collaborative groups into a new taskforce for overcoming energy storage challenges;
- Public and private support of policy development to assist growth and development of the sector (lobbying); and
- Establishment of a communication network for transfer of important information to stakeholders within this emerging sector.

Overall, this TechClinic™ provided the forum for key stakeholders to come together to understand the market needs of the emerging industry and its value chain, and to devise solutions for overcoming key industry obstacles and market gaps to seize opportunities.

3. TechFast Program

3.1 Program Overview

TechFast® is funded by both Australian and State governments and has been delivered across the six states since 2004-05. TechFast® is a needs-driven business support program that works with businesses to assist in areas that require external capability. It achieves this by helping companies to identify their area of need and to link companies with the right people, organisations and expertise to build their capacity and capabilities in selected areas. Specifically, TechFast® provides:

- Practical, hands-on support to facilitate company growth and development;
- The mechanism for collaborations and business networks to be formed;
- Access to additional innovation and commercial experience and support;
- Access to new sources of innovation and ideas; and
- Assistance through independent facilitation of new commercial negotiation and partnership agreements.

3.1.1 Participation & Funding

Total Australian TechFast® Program funding is estimated to have been \$5.4 million between 2004 and 2010. Over this period the program has been delivered to 194 program participants, with most of these being located in Victoria (83), followed by Queensland (59) and South Australia (30).

Table 3.1: TechFast® Program Funding 2004-2010

State/Federal Funding	Funding (\$)
Australian Commonwealth Government Funding	\$1,844,000
State Government Funding	\$3,515,000
Victoria	\$1,990,000
Queensland	\$675,000
New South Wales (Includes ACT)	0
South Australia	\$850,000
Western Australia	0
Tasmania	0
Northern Territory	0
Total Australia Program Funding	\$5,359,000

Source: AIC (2010)

3.1.2 Key Outcomes & Program Benefits

The outputs of the TechFast® program are targeted toward connecting business with the right organisations to deliver real business innovation solutions. Specifically, the program provides:

- Facilitation of introduction of companies to research organisations, thereby facilitating collaborations and partnership formulation;
- Assistance with commercial negotiation and partnership agreement;
- Knowledge of existing and emerging markets;
- Business growth and diversification assistance; and
- Accessibility to additional innovation and commercial innovation support.

Consultation with program participants indicated that direct benefits to their business (increase in sales, employment, exports) are not directly seen until approximately two years after the initial program participation, over which time, products are developed and tested in the marketplace (refer to **Chapter 2.0**).

3.2 Economic Impact of TechFast® Program

Economic activity driven by the AIC TechFast® Program includes the additional expenditure on R&D (that would otherwise not be undertaken), and additional turnover and business activity created through the participation of business in the TechFast® Program.

Based on the consultation findings of the TechFast® Queensland Program it is assumed that the delivery of TechFast® across the participating states of Australia is likely to have similar benefit to business participants as those experienced by businesses in Queensland¹.

All other cost and program input data (e.g. participants by industry, average turnover, etc.) were sourced directly from the AIC, based on data provided by all the participating firms.

3.2.1 Key Drivers & Inputs

The key drivers and inputs for the TechFast® Program economic impact assessment include:

- **Business Participation:** Between 2004 and 2010, business participants of the TechFast® program include:
 - 59 Queensland companies;
 - 84 Victoria companies;
 - 11 New South Wales companies;
 - 30 South Australia companies;
 - 7 Western Australian companies; and
 - 4 Tasmania companies.
- **Increased Business Sales Revenues from Program Participation:** Research, development and adoption of new technologies and techniques can often take many years before benefits are realised on-ground. TechFast®, through its role as an innovation and commercialisation catalyst, is therefore not anticipated to deliver immediate on-ground benefits in terms of increased profits over the short-term. Findings from Queensland businesses studied suggest, on average, those businesses receiving a benefit from their involvement in the TechFast® program reported an approximate two year lag from their initial TechFast® engagement to the realisation of benefits, benefits generally peaking a number of years later. Queensland companies identified that once fully adopted, benefits could range from **between a 10% to 25% increase in turnover**² over and above what they could have otherwise achieved without the TechFast® Program. Based on consultation with Queensland business, it is estimated that approximately **40% of small to medium-sized businesses**³ involved in the TechFast® program achieve these benefits. It has been assumed that similar business impacts are received by all other Australian companies that participate in the TechFast® program, regardless of the State in which the program is delivered.

¹ Refer to the *AIC Innovation & Collaboration Program EIA Report, October 2010*.

² Expected increases in turnover of 10% to 25% were determined through direct consultation with TechFast® businesses. Of those businesses that identified actual (within the past five years) or potential benefits (to be returned over the next 5 years), companies were asked to provide an estimate of current and future (next two to five years) business turnover and the percentage of business activity attributable to adoption of new technology developed as a result of the TechFast® program. From this information an expected growth path in revenues could be determined. The steady state increase in revenues as a proportion of total company revenues was then calculated with most companies falling between a range of 10% and 25% increase in annual revenues.

³ Four of the ten TechFast® businesses (40%) consulted identified business and economic benefits resulting from participation in the TechFast® program. It should be noted that another three businesses (30%) indicated that some benefits may be returned as a result of program participation over the next two to five years but were unable to answer with any certainty to what the magnitude (if any) of increases in sales and revenues would be. The remaining 30% of businesses did not identify any current or potential future economic benefits from the TechFast® program.

- **Business Turnover & Additional Output:** Average turnover for TechFast® participating businesses was calculated to be \$11.9 million for Victoria SME's (data provided from AIC), \$6.1 million for Queensland SME's (data provided by AIC) and an average of \$9.0 million for the remaining SME's in the States of South Australia, Western Australia, New South Wales and Tasmania (average of Queensland and Victoria business turnover).

3.2.2 Economic Impact

To assess the impact of the TechFast® Program in the participating states of Queensland, Victoria, New South Wales, South Australia, Western Australia and Tasmania and the impact on the entire Australian economy, two scenarios were developed based on consultation findings from businesses in Queensland to understand the level of increased business activity resulting from TechFast® assistance in the innovation and commercialisation process. Benefits of an increase in revenues of between 10% and 25% were identified by approximately 40% of consultees involved in the TechFast® program, which resulted in the following two scenarios being examined:

- **Low Scenario:** Increased business activity of 10% for 40% of companies involved in the TechFast® program; and
- **High Scenario:** Increased business activity of 25% for 40% of companies involved in the TechFast® program.

All economic returns were assessed in terms of annual average economic benefits. It should be noted that of the 194 Australia based companies that have been assisted by the TechFast® Program, many are yet to realise the full commercial benefits of participating in the TechFast® Program. **As such, the average business benefits of program participation are likely to be under-representative of future economic benefits at full adoption.**

Low Scenario

The **low scenario** (increase in business turnover of 10%) indicates that the TechFast® program is estimated to generate a total annual benefit of \$141.9 million in output (\$72.5 million direct and \$69.4 million indirect) to the Australian economy once the R&D developed has been fully adopted following TechFast® Program assistance. This is expected to result in an additional 443 full-time equivalent (FTE)⁴ employment positions, \$58.2 million in value-added activity and \$34.5 million in additional incomes paid each year. Of the 194 Australia companies that have participated to-date, this equates to an **average annual direct benefit of an additional \$374,000 in output per company.**

High Scenario

Assessment of the **high scenario** (increase in business turnover of 25%) indicates that the TechFast® program could generate a total annual benefit of up to \$354.9 million in output (\$181.2 million direct and \$173.6 million indirect) to the Australian economy once R&D has been fully adopted following TechFast® Program assistance. This is expected to result in an additional 1,107 FTE employment positions, \$145.4 million in value-added activity and \$86.2 million in additional incomes paid each year. Of the 194 Australian companies that have participated to-date, this equates to an **average annual direct benefit of an additional \$934,000 in output per company.**

The data is summarised on a state-by-state basis in Table 3.2

⁴ Where one FTE employment positions is equivalent to one person employed full time for one year.

Table 3.2: Estimated Total Annual Increased Business Activity, 2009-10 Dollars (\$)

	Low Scenario				High Scenario			
	Output (\$M)	Value Added (\$M)	Income (\$M)	Employment (FTE)	Output (\$M)	Value Added (\$M)	Income (\$M)	Employment (FTE)
Queensland								
Direct	\$14.4	\$5.5	\$3.6	48	\$36.0	\$13.8	\$9.0	120
Flow-On	\$11.7	\$5.0	\$2.7	41	\$29.2	\$12.5	\$6.7	104
TOTAL	\$26.1	\$10.5	\$6.3	90	\$65.2	\$26.3	\$15.7	224
Victoria								
Direct	\$39.4	\$14.9	\$9.9	161	\$98.5	\$37.2	\$24.8	402
Flow-On	\$31.2	\$13.0	\$7.5	114	\$78.1	\$32.5	\$18.6	285
TOTAL	\$70.6	\$27.9	\$17.4	275	\$176.6	\$69.7	\$43.5	687
New South Wales								
Direct	\$4.0	\$1.5	\$1.0	15	\$9.9	\$3.8	\$2.5	37
Flow-On	\$3.5	\$1.5	\$0.8	13	\$8.8	\$3.7	\$2.1	32
TOTAL	\$7.5	\$3.0	\$1.8	28	\$18.7	\$7.4	\$4.5	69
South Australia								
Direct	\$10.8	\$4.1	\$2.7	41	\$27.0	\$10.2	\$6.8	102
Flow-On	\$8.7	\$3.7	\$2.0	31	\$21.8	\$9.3	\$5.1	79
TOTAL	\$19.5	\$7.8	\$4.7	72	\$48.7	\$19.5	\$11.9	180
Western Australia								
Direct	\$2.5	\$1.0	\$0.6	9	\$6.3	\$2.4	\$1.6	24
Flow-On	\$2.2	\$0.9	\$0.5	7	\$5.4	\$2.3	\$1.2	19
TOTAL	\$4.7	\$1.9	\$1.1	17	\$11.7	\$4.7	\$2.8	42
Tasmania								
Direct	\$1.4	\$0.5	\$0.4	5	\$3.6	\$1.4	\$0.9	14
Flow-On	\$1.1	\$0.5	\$0.3	4	\$2.7	\$1.2	\$0.6	10
TOTAL	\$2.5	\$1.0	\$0.6	9	\$6.3	\$2.5	\$1.5	24
Australia								
Direct	\$72.5	\$28.5	\$18.0	233	\$181.2	\$71.2	\$45.1	583
Flow-On	\$69.4	\$29.7	\$16.5	210	\$173.6	\$74.2	\$41.1	524
TOTAL	\$141.9	\$58.2	\$34.5	443	\$354.9	\$145.4	\$86.2	1,107

Note: Totals may not sum due to rounding.

Sources: Australian Bureau of Statistics (2010; 2009a; 2009b), AECgroup.

4. Ideas2Market Program

4.1 Program Overview

This program is a small business program that assists entrepreneurs and businesses in recognising a valuable idea and taking it to market through the realisation of its commercial opportunity. This program is funded primarily through the Queensland Department of Employment, Economic Development & Innovation (DEEDI) and provides entrepreneurs and small business with the knowledge and skills to improve their competitive advantage. The program is delivered through two workshops:

- Ideas2Market Introductory Workshop: "Taking an Innovative Idea to Market"; and
- Ideas2Market Master Class Workshop: "Strategic Innovation for a Growing Business".

Each of these workshops caters for two different business lifecycles with the first being for those seeking to start a business or progress an invention, and the second targeting existing business which are looking to grow sustainably.

4.1.1 Participation & Funding

Ideas2Market has been primarily delivered in Queensland (90% of all courses delivered) since 2005 and periodically in other states, with a total of 1,319 course attendees across Australia (of which, 1,197 are Queensland based). Queensland program funding over this time has been \$822,600 or an average of \$643 per program attendee.

Table 4.1: Ideas2Market Program Funding, Queensland

	2004-05	2005-06	2006-07	2007-08	2008-09	Total
Queensland	\$160,000	\$79,000	\$221,800	\$211,800	\$150,000	\$822,600
Australia	\$160,000	\$264,000	\$221,800	\$211,800	\$150,000	\$1,007,600

Source: AIC (2010)

4.1.2 Key Outcomes

Each workshop provides a 'toolkit' of information to assist firms to grow their business. The objective of the workshop is to increase the skills and knowledge base of participants, so they are better prepared and informed as they commercialise their ideas. Many also benefit from validation of their existing strategies, and from meeting other local course attendees. Key topics included in each workshop include:

Introductory Workshop

- Determining feasibility;
- Business planning;
- Intellectual property protection;
- Marketing strategies;
- Accessing funding and government grants;
- Commercialisation pathways.

Master Class Workshop

- Building and validating your business model;
- Managing the right team;
- Brand strategy and marketing techniques to assist market entry;
- Innovation and product development strategies;
- Strategic IP management; and
- Product exporting.

4.2 Economic Impact of Ideas2Market Program

Ten Ideas2Market workshop participants (all from Queensland) were consulted (refer to **Appendix B**) to determine the additional economic benefit or activities that occur as a result of program participation. All other cost and program input data were sourced directly from the AIC.

4.2.1 Key Drivers & Inputs

The key drivers and inputs for the Ideas2Market Program economic impact assessment include:

- Increased Business Sales & Revenues:** On average most businesses are yet to see the benefits of program participation translated into increased business sales and revenues, however, a small proportion (between 10% and 20%)⁵ had seen some improvements in processes or benefits through collaborations with industry participants, which are expected to translate into improvements in business activity over the next two years. Improvements through marketing, IP protection, accessibility to funding and government grants and market diversification are estimated to produce an average increase of 3% to 5% in business sales, revenues or productivity improvements⁶. It is estimated that the average small to medium enterprise in Queensland has an estimated turnover of \$711,268 in 2006-07, equating to an additional \$21,000 to \$36,000 in output per business.

4.2.2 Economic Impact

It was estimated that on average the Ideas2Market program could generate a total annual benefit of \$9.4 million in Queensland (\$5.5 million direct and \$4.0 million indirect benefits).

This is expected to result in 48 employees, \$4.5 million in value added and \$2.5 million in additional incomes paid each year (direct and indirect).

On average, direct benefits to business average approximately \$4,564 in additional output per annum for participating business (direct impact).

Table 4.2. Estimated Annual Increased Business Activity, 2009-10 Dollars (\$)

	Output (\$M)	Value Added (\$M)	Income (\$M)	Employment (FTE)
Queensland				
Direct	\$5.5	\$2.6	\$1.4	32
Flow-On	\$4.0	\$1.8	\$0.9	15
TOTAL	\$9.4	\$4.3	\$2.4	46

Note: Impacts to the Australia economy have not been calculated due to Queensland making up 90% of the total participants. Consultation only targeted the Queensland sample.

Sources: Australian Bureau of Statistics (2010; 2009a; 2009b), AECgroup.

⁵ Of the ten participants consulted, two (20%) identified the Ideas2Market workshops as providing noticeable economic benefits. The remaining eight participants consulted (80%) did not identify any direct economic benefits resulting from the Ideas2Market workshops and considered the material covered too broad to contribute any immediate benefits to their business.

⁶ Of the two participants (20%) that identified economic benefits resulting from their attendance at Ideas2Market workshops, their participation was estimated to provide an increase in sales/revenues of between 3% to 5%. Of the remaining participants, there was an expectation that some of the knowledge from the workshops might be used in the future but further information and company research would be required to actively translate this workshop content into actions that would create increased returns to business.

5. TechClinic Program

5.1 Program Overview

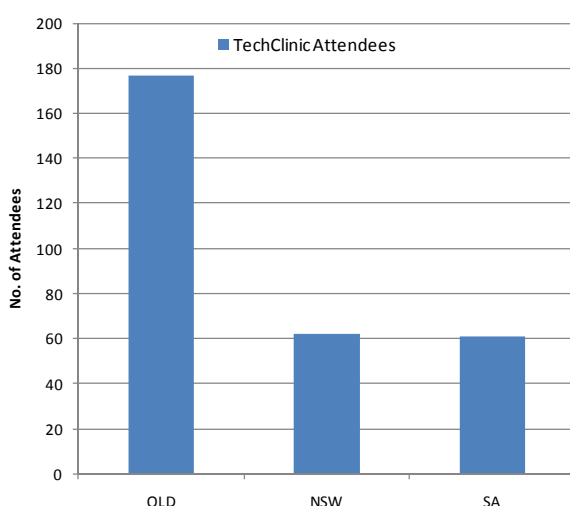
TechClinics™ assist in the development of new industry sectors through targeted collaboration between research organisations, businesses, and customers along new industry value chains. TechClinics™ help participants to understand a pre-selected issue and identify opportunities for further development projects. TechClinic™ then identifies processes to implement innovative solutions by collaborating along the value chain, in order to achieve these opportunities.

TechClinic™ promotes the adoption of innovation and technology to solve customer problems for industry, and thereby the development of new industry value chains and networks.

5.1.1 Participation & Funding

TechClinics™ are currently delivered across Queensland and other Australian states, with 177 program attendees participating in TechClinics™ funded by the Queensland Government (59.0% of all attendees). Over the past two years, funding for this program in Queensland has amounted to \$295,000 or an average of \$1,667 per course participant.

Figure 5.1: TechClinic™ Workshop Attendees – By State



Source: AIC (2010)

Table 5.1: TechClinic™ Program Funding, Queensland

	2006-07	2007-08	2008-09	2009-10	Total
Queensland	n.a	n.a	\$130,000	\$165,000	\$295,000

Source: AIC (2010)

5.1.2 Key Outcomes

TechClinic™ programs provide the catalyst for technology to be developed and utilised by key stakeholders, involving the research community, government, business and end-users. Overall the key outcomes of the program include:

- Identification/prioritisation of R&D projects to be pursued;
- Identification of long-term R&D priorities; and
- Identification of appropriate parties to participate in research and commercialisation activities.

5.2 Economic Impact of TechClinic Program

The TechClinic™ Program is the most recent program delivered by the AIC in Queensland and around Australia. TechClinic™ has been delivered to approximately 177 program attendees and assists in the development of new industry sectors through targeted collaboration between research organisations, businesses, and customers along new industry value chains. In Queensland, approximately ten TechClinics™ have been held in the past two years around the state. As such, many of these projects are yet to reach a point of commercialisation.

However, analysis of Ideas2Market and TechFast® direct benefits indicates that each program would have an average annual program benefit of \$11.40 and \$32.50 (average of low and high scenarios) for each program dollar spent, respectively, 2 to 5 years post-program completion.

To date, \$295,000 has been spent on delivery of the TechClinic™ Program in Queensland, with expected benefits to be achieved by participants over the next five years. If the success of TechClinic™ is in line with the benefits achieved through TechFast® and Ideas2Market, then the TechClinic™ Program benefits could be in the order of between \$3.4 million and \$9.6 million in additional output (direct) over the next five years.

To confirm the success of this program over the next five years, it will be important to monitor and assess the commercialisation process and outcomes achieved by TechClinic™ Program participants.

6. Key Findings

For most program participants, there is a significant lag time, averaging approximately two years from the point of program participation to product commercialisation, with an associated ramp-up period to full adoption (with an average of between two to five years for outcomes to be observed). The results presented are indicative of the average annual future benefits that could result once R&D, resulting from TechFast® and Ideas2Market programs, is fully adopted.

This analysis only incorporates those businesses currently participating in either the TechFast® or Ideas2Market programs. As more businesses participate in AIC programs, more economic benefits are anticipated to result over the next two to ten years. Further, the innovations developed as a result of the AIC programs have the potential to be adopted more widely by industry, and the skills developed by workers as a result of these new technologies and techniques could be transferred through future employee movement. This could extend the benefits of the AIC programs to a considerably larger segment of the national economy.

Programs delivered through the AIC have been found to generate a number of financial and non-financial economic benefits to business each year by successfully raising skills and facilitating the innovation and commercialisation process for hundreds of businesses in the Australian business community.

Financial benefits can be summarised as:

- Across Australia, the delivery of **TechFast®** is estimated to have resulted in:
 - A direct increase in business output of between \$373,674 and \$934,186 per annum for each business/ participant;
 - A direct increase in value-add of between \$146,800 and \$367,001 per annum for each business/ participant;
 - A direct increase in incomes of between \$93,011 and \$232,528 per annum for each business/ participant; and
 - A direct increase in employment of between 1 and 3 FTE's for each business/ participant.
- Across Queensland, the delivery of **Ideas2Market** Program is estimated to have resulted in:
 - A direct increase in business output of \$4,564 per annum for each business/ participant;
 - A direct increase in value-add of between \$2,163 per annum for each business/ participant; and
 - A direct increase in incomes of between \$1,181 per annum for each business/ participant.
- In Queensland, TechClinic™ has an estimated (direct) future benefit of between \$3.4 million and \$9.6 million in output across all TechClinic™ businesses (current participants).

Non-financial benefits delivered across the three programs include:

- Environmental benefits, including emissions reductions, environmental management and waste treatment processes and renewable energy technology;
- Social benefits, including in health and medical devices;
- Product diversification and increased market share;
- Collaborations and partnerships; and
- Knowledge and understanding of markets and opportunities for complementary product alliances to be made.

The delivery of AIC programs, such as TechFast®, Ideas2Market and TechClinic™, provide valuable benefits to the Australian business community through the AIC's role as

an innovation intermediary and commercialisation catalyst for small and medium enterprises. The AIC has a unique ability to connect business and industry with complementary R&D specialists and technical expertise, allowing for innovative technology to be developed and commercially applied.

Without the support of AIC programs, many businesses indicated that innovation followed by commercialisation would have been unlikely to occur without the facilitation of vital collaborations and advice through these programs, or would have occurred at a significantly slower rate (and higher cost).

Ongoing delivery of business support programs to speed up the innovation-commercialisation processes and facilitation of growth in high-technology exports will be integral in establishing Australia as a competitive knowledge-based innovation and commercialisation centre within the broader global economy.

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Appendix A: Input-Output Methodology

Model Overview

Input-Output (IO) analysis demonstrates inter-industry relationships in an economy, depicting how the output of one industry is purchased by other industries, households, the government and external parties (i.e., exports), as well as expenditure on other factors of production such as labour, capital and imports. IO analysis shows the direct and indirect (flow-on) effects of one sector on other sectors and the general economy. As such, IO modelling can be used to demonstrate the economic contribution of a sector on the overall economy and how much the economy relies on this sector or to examine a change in final demand of any one sector and the resultant change in activity of its supporting sectors.

The economic contribution can be traced through the economic system via:

- Direct impacts, which are the first round of effects from direct operational expenditure on goods and services; and
- Flow-on impacts, which comprise the second and subsequent round effects of increased purchases by suppliers in response to increased sales.

These effects can be identified through the examination of four types of impacts:

- **Output:** Refers to the gross value of goods and services transacted, including the costs of goods and services used in the development and provision of the final product. Output typically overstate the economic impacts as it counts all goods and services used in one stage of production as an input to later stages of production, hence counting their contribution more than once;
- **Value added:** Refers to the value of output after deducting the cost of goods and services inputs in the production process. Value added defines the true net contribution and is subsequently the preferred measure for assessing economic impacts;
- **Income:** Measures the level of wages and salaries paid to employees of the industry under consideration and to other industries benefiting from the project; and
- **Employment:** Refers to the part-time and full-time employment positions generated by the economic shock, both directly and indirectly through flow-on activity, and is expressed in terms of full time equivalent (FTE) positions.

Input-output multipliers can be derived from open (Type I) IO models or closed (Type II) models. Open models show the direct effects of spending in a particular industry as well as the indirect or flow-on (industrial support) effects of additional activities undertaken by industries increasing their activity in response to the direct spending. The economic impact assessment undertaken for this report uses an open model to assess the economic impacts of the project to identify the direct and flow-on industry impacts induced by the initial expenditure.

Closed models re-circulate the labour income earned as a result of the initial spending through other industry and commodity groups to estimate consumption induced effects (or impacts from increased household consumption). Closed models (or Type II impacts) are generally considered to overstate the impacts of an economic shock, and as such has not been used as the primary estimates in this assessment.

Modelling Assumptions

The modelling drivers for this assessment are outlined in Chapter 4.

The key assumptions and limitations of IO analysis include:

- The inputs purchased by each industry are a function only of the level of output of that industry. The input function is generally assumed linear and homogenous of degree one (which implies constant returns to scale and no substitution between inputs);
- Each commodity (or group of commodities) is supplied by a single industry or sector of production. This implies that there is only one method used to produce each commodity and that each sector has only one primary output;

- The total effect of carrying on several types of production is the sum of the separate effects. This rules out external economies and diseconomies and is known simply as the additivity assumption. This generally does not reflect real world operations;
- The system is in equilibrium at given prices. This is not the case in an economic system subject to external influences; and
- In the static input-output model, there are no capacity constraints so that the supply of each good is perfectly elastic. Each industry can supply whatever quantity is demanded of it and there are no capital restrictions. This assumption would come into play depending upon the magnitude of the changes in quantities demanded.

Despite these limitations, IO techniques provide a solid approach for taking account of the inter-relationships between the various sectors of the economy in the short-term and provide useful insight into the quantum of final demand for goods and services, both directly and indirectly, likely to be generated by a project, program or policy.

Statistical Significance

Given that only a small sample of program participants were consulted for TechFast® (10 participants) and Ideas2Market (10 participants) programs, the findings of this report are not statistically significant.

For a 95% confidence level of a +/-5% confidence interval to be achieved the following sample sizes are required (Survey System, 2010):

TechFast®

- **Queensland:** 40 businesses to be surveyed for a total of 45 business program participants;
- **Australia:** 108 businesses to be surveyed for a total of 149 business program participants;

Ideas2Market

- **Queensland:** 291 businesses to be surveyed for a total of 1,197 business program participants; and
- **Australia:** 296 businesses to be surveyed for a total of 1,280 business program participants.

Appendix B: Stakeholders Consulted

The following twenty (20) organisations were consulted during this project to assist in understanding business and industry requirements from AIC initiatives and their expected economic benefits that have resulted or are likely to result from participation in AIC delivered programs. Key stakeholders consulted include:

- Russell Mineral Equipment (Qld);
- Kargo (Qld);
- Plasvacc (Qld);
- Churchill abattoir (Qld);
- Redarc technologies in (SA);
- Frontline Australasia (Vic);
- Ripcurl in (Vic);
- GroundProbe (Qld);
- RST (WA);
- Biolytix (Qld);
- Bioproton (Qld);
- In Depth Video & Photography (Qld);
- Wild Mountain Cellars (Qld);
- Sunsmart Townsville Pty Ltd (Qld);
- Australian Agricultural College Corporation (Qld);
- Delaney Photography (Qld);
- Hydraulic Solutions (Qld);
- Fashion Arena (Qld);
- Genetic Biomedical Research (Qld);
- Lifehaler (Qld); and
- Ecovation (Qld).

Consultees were asked to provide their input and expectations for their organisation regarding the following topics:

- Types of business activities currently engaged in;
- Existing turnover and employment levels and changes in turnover and employment from being in the program;
- Opportunities offered by participation in AIC programs that would otherwise not be achievable;
- Potential new markets that may be accessed as a result of AIC programs;
- Potential benefits of the AIC programs in terms of additional turnover and employment;
- Potential changes to skills requirements as a result of the AIC programs;
- Current R&D activities and expenditure;
- Current and anticipated benefits of being part of AIC programs; and
- Potential areas for improvement of AIC programs.

AEC Group Economic Impact Assessment Experience

AEC Group Limited (AECgroup) is one of the largest and most diverse consulting firms in Australia, and has been in operation since 1990. AECgroup offers an extensive range of services to both public and private sector clients, and we believe that this provides our clients with an integrated approach that blends information access, analysis, technology and evaluation.

AECgroup's expertise extends into the following divisional areas:

- AECeconomics, planning & development;
- AECbusiness strategy & finance;
- AECcommunity research & strategy;
- AECinformation & knowledge management; and
- AECdesign, marketing & advertising.

AECgroup provides specialist skills and experience in undertaking economic impact assessments (EIAs) for a diverse range of infrastructure projects, industry operations and government policy. Our EIAs utilise a range of tools and modelling techniques to appropriately assess the economic impacts for a given project to clients' requirements and budget, including Input-Output (IO) models and Computable General Equilibrium (CGE) modelling.

IO modelling and analysis demonstrates inter-industry relationships in an economy, depicting how the output of one industry is purchased by other industries, households, the government and external parties (i.e., exports), as well as expenditure on other factors of production such as labour, capital and imports. IO analysis shows the direct and indirect (flow-on) effects of one sector on other sectors and the general economy. As such, IO modelling can be used to demonstrate the economic contribution of a sector on the overall economy or how much a change in final demand of any one sector will impact on demand for goods and services in other sectors within an economy.

CGE modelling utilises a similar approach to IO analysis for identifying and tracing impacts through an economy. However, where IO analysis utilises a comparative static approach to assessing impacts (i.e., assumes industry production functions and purchasing patterns within an economy remain constant) CGE modelling applies a dynamic set of production functions and incorporates likely resource constraints confronting an economy (e.g., labour supply/ shortages). In this sense, CGE modelling is typically considered to present modelling outcomes that are more realistic of the net overall impacts to an economy, while IO analysis provides an indication of the overall (gross) demand generated by an economic stimulus (without reference to potential draw of resources from other sectors).

The IO modelling approach was used to assess the AIC Innovation & Collaboration Program Economic Impact Assessment (EIA).

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