



AUSTRALIAN INDUSTRY
GROUP

AUSTRALIAN INDUSTRY GROUP SUBMISSION

Joint Committee on the National Broadband Network
Six-Monthly Review of the National Broadband Network Rollout

5 April 2012

EXECUTIVE SUMMARY

The Australian Industry Group (Ai Group) welcomes the opportunity to provide a submission to the Joint Committee on the National Broadband Network's (NBN) six-monthly review of the NBN rollout.

Ai Group is a peak industry association in Australia which along with its affiliates represents the interests of more than 60,000 businesses in an expanding range of sectors including: manufacturing; engineering; construction; automotive; food; transport; information technology; telecommunications; call centres; labour hire; printing; defence; mining equipment and supplies; airlines; and other industries. The businesses we represent employ more than 1 million employees.

Ai Group's comments relate to the e-readiness of business, and in particular small and medium enterprises (SMEs). This submission is based on findings from the recent Australian Industry Group National CEO Survey: Business Investment in New Technologies which surveyed 540 Chief Executive Officers (CEOs) in the manufacturing, services and construction sectors. The full report is attached to this submission.¹

The report concluded:

- Business investment in new technologies is central to the ongoing transformation of the Australian economy.
- Ubiquitous broadband promises important opportunities for Australian businesses to build competitive advantages.
- Australian businesses recognise the benefits of online technologies, with a near unanimous view amongst businesses surveyed that the internet has had a positive impact on productivity levels.
- However, individual business awareness of, and preparedness for, faster broadband varies considerably.
- In particular, SMEs report lower levels of information about the benefits of faster broadband compared with larger businesses. SMEs also tend to have less confidence that they have the skills / capabilities to take advantage of a new broadband network.

These findings highlight that initiatives to improve the e-readiness of business must accompany the rollout of infrastructure if businesses and communities are to take full advantage of the opportunities that faster broadband offers.

While these initiatives will be partly driven by industry, Governments also has a role in setting a complementary policy framework. Section Two of this submission identifies possible policy options to improve business e-readiness including programs to educate and support businesses about broadband opportunities, ensuring the competitiveness of tax arrangements and encouraging collaboration between the research and business sectors.

¹ The full report is also available at:
http://www.aigroup.com.au/portal/binary/com.epicentric.contentmanagement.servlet.ContentDeliveryServlet/LIVE_CONTENT/Publications/Reports/2012/10767_ceo_survey_report_technology_web.pdf

Section One: Findings from the Business Investment in New Technologies Report

Business Investment in New Technologies

In January 2012, Ai Group published the National CEO Report on Business Investment in New Technologies.² The report examined the level and nature of business investment in new technologies over the last three years. It also looked at how businesses are placed to take advantage of a national broadband network and online technologies.

The report's findings highlighted the benefits of investing in new technologies. The report found that, on average, new technologies accounted for around 16% of business productivity gains. It is also identified that increasing productivity was the key driver for business investment in new technologies, with over 70% of businesses citing this as a reason for investing. Investment in new technologies increased with business size and performance.

Of businesses that invested in new technologies in the last three years:

- On average 25% developed new technologies internally and 8% collaborated with research organisations.
- Businesses were most likely to acquire technologies from an external supplier; however, this technology was often adapted to meet specific business needs.
- SMEs were more likely to purchase off the shelf products and it was less common for SMEs to purchase adapted products compared with large organisations or to develop products internally.
- Collaboration with research organisations was comparable for small and large organisations (although low in both cases), whilst medium sized companies were least likely to collaborate with research institutions.

The most common sources of information about new technologies for businesses were clients or suppliers, the Internet or journals, employees, consultants, seminars / conferences and industry associations. Overall, less than 5% of businesses reported that they directly sourced information on new technologies from government or research institutions.

Importance of the Internet for Business Activities

The Business Investment in New Technologies report also looked specifically at business use of online technologies. The report confirmed the importance of online activities to business productivity. The businesses surveyed were nearly unanimous in reporting that the internet has had a significantly positive or positive impact on their productivity. Internet activity was most important for financial activities, data exchange and placing and receiving orders.

Governments and agencies also appear to play an important role in shaping how businesses use the internet, with nearly one-third of business respondents reporting that the internet was very important for electronic lodgement, such as for licence applications. Electronic reporting combined with the harmonisation of Government reporting requirements and Standard Business Reporting initiatives could be a useful tool for improving e-readiness whilst also reducing compliance costs for businesses.

²Technologies in the survey was broadly defined to include computers, software, machinery and equipment, and telecommunications systems.

Business understanding of the practical impacts of faster broadband

Overall, 30% of businesses surveyed reported that they had a high – medium understanding of the practical impacts of faster broadband.

However, around seventy-two per cent of small and medium business respondents reported that they had no understanding or a low understanding of the practical benefits of faster broadband. This compared with 58% for larger businesses. This suggests SMEs may need some assistance to understand what faster broadband means for their business.

Business readiness for a new broadband network

Around 55% of businesses reported that they, to a high or medium degree, had the skills / capabilities to take advantage of a new national broadband network. When Ai Group conducted a similar survey in 2008, this figure was 80%. This finding may suggest that as businesses have become more aware of the opportunities and applications that will become available to them once a broadband network is in place, they have become less confident in their present ability to take full advantage of them.

Small businesses had the least confidence in their ability to take advantage of a new broadband network. Just under 50% of small businesses surveyed rated their business readiness for a new broadband network as low – none, while the figure was closer to 40% for both medium and large businesses.

The most common strategies that businesses are considering to prepare for a national broadband network are training existing staff (80%) and employing new staff (25%).

Section Two: Improving E-readiness

The Business Investment in New Technologies Report identified a number of policy options for improving the e-readiness of business and particularly SMEs. These include:

1. Improving the dissemination of information about new technologies

The findings from the Business Investment in New Technologies Report suggests there is significant scope to improve business understanding of the practical impact of faster broadband and to improve business readiness to take advantage of a new broadband network. This is particularly the case amongst SMEs and for businesses in rural and regional areas.

Government has a role to play in helping to facilitate the dissemination of information about new technologies. This could include encouraging 'cluster-type' activities that bring businesses together and encourage the transfer of knowledge. It could also involve developing case studies showing how businesses are successfully utilising services and applications enabled by broadband. These case studies could focus on businesses of a particular size, on regions or on sectors.

The Business Investment in New Technologies research shows that businesses generally get information about new technologies from sources other than Government (for example, suppliers, clients, employees, and industry associations). This should be taken into account when designing communication campaigns or programs targeted at business.

Another area where further work may be required is benchmarking business e-readiness. This could help identify the e-readiness of different parts of the business community (for example, based on

business size, sector or region). It may also assist in understanding the reasons why businesses are more or less ready, which could aid the design and targeting of policy initiatives.

2. Government programs to boost understanding of SMEs of the opportunities provided by a national broadband network

The Federal Government's Digital Enterprise Initiative is a positive first step towards increasing the proportion of Australian businesses using online technologies. However, realising the National Digital Economy Strategy's vision of Australia placing in the top five OECD countries for business use of online technologies will require further initiatives. Ai Group supports the rollout of a five year flagship plan to educate and support businesses, particularly SMEs and businesses in regional areas. This could involve:

- Top-down work with leaders in business, technology and research organisations to define the state of the art in knowledge or productivity and broadband;
- Bottom-up work with individual businesses to assess their opportunities for and barriers to productivity-enhancing uses of broadband; and
- Accessible communication of the results to industry through existing business channels.

3. Developing better industry-driven mechanisms for collaboration between publicly funded research organisations and businesses.

The Business Investment in New Technologies Report showed a low level of collaboration between businesses and research institutions. Less than 5% of businesses directly sourced information from research institutions. Furthermore, only 8% of all businesses and 6% of manufacturers that invested in new technologies in the past three years did so in collaboration with a research organisation. These rates may be able to be lifted through the provision of accessible information to a cross-section of industries.

4. Improving the competitiveness of tax arrangements by lowering the company tax rate or through more targeted measures.

Survey respondents reported that Australia's relatively high tax rate was an impediment to investment. This was most pronounced amongst businesses that had not invested in new technologies over the past three years. This underscores that broader economic policy settings, in addition to sector-specific policies and programs, affect the capacity of businesses to take advantage of the opportunities afforded by broadband infrastructure and online services.



The Australian Industry Group **NATIONAL CEO SURVEY:** Business Investment in New Technologies



January 2012



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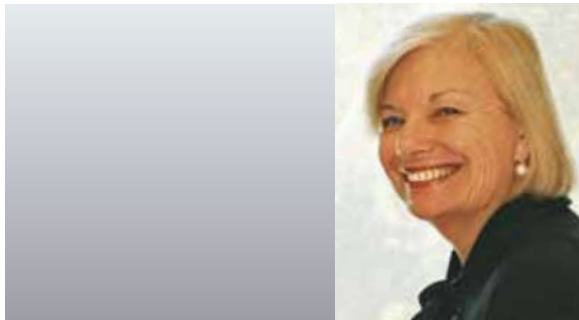
The Australian Industry Group
NATIONAL CEO SURVEY:

Business Investment in New Technologies

January 2012

Foreword

Ai Group



Business investment in new technologies is central to the ongoing transformation of the Australian economy. At a time when business investment in the mining sector is so prominent, less attention has been given to investment by businesses in other sectors. Yet, even over the past three years, notwithstanding the rapid growth in the relative importance of mining sector investment, investment by non-mining sectors has been close to double the level in the mining sector.¹ Investment in new technologies is particularly important for non-mining trade exposed sectors, including manufacturing, where considerable transformations are underway as businesses confront the higher Australian dollar, the legacy of slow rates of productivity growth over an extended period, rising energy costs and growing inflexibilities in workplace relations.

This report presents the findings of a survey of 540 Chief Executive Officers (CEOs) of businesses in the manufacturing, services and construction sectors. With adoption of new technologies being an important contributor to business-level productivity improvements, the report shows that businesses in these sectors have been active investors in a broad cross-section of new technologies over the past three years. Investment in new technologies accounted for an average of 21 per cent of respondents' total investments over this period.

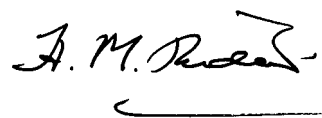
The report explores the sources of new technologies including as a result of internal research and development (R&D), through collaboration with

research agencies and by purchase from external suppliers, and it looks at where businesses obtain information about new technologies. Respondents invested in a variety of new technologies including in ICT hardware and software, automation, robotics, control equipment and instruments, a wide range of other machinery and equipment as well as security and surveillance equipment and systems.

While there were a range of motivations for investment in new technologies, improving productivity, including through greater energy efficiency; improving data management; and the development of new or improved products and services stand out as key factors. Construction and manufacturing sector businesses in particular invested in new technologies to improve workplace safety. Across all sectors, businesses invested in new technologies to reduce their exposure to labour costs, to comply with government regulation and to reduce environmental impacts. Close to 80 per cent of respondents reported making investments in new technologies over the last three years.

Individual sections of the report are devoted to the R&D Tax Incentive and to the preparedness of business to take advantage of the opportunities of ubiquitous high-speed broadband.

- The Report points to the strong scope for policy improvement in the areas of taxation; collaboration between public sector research organisations and businesses; and the availability and provision of information about new technologies, particularly for small and medium-sized businesses.
- With a significant proportion of businesses anticipating that the new Research and Development Tax Incentive will impact them negatively, the report also points to the need to monitor very closely the workings of the new arrangements and the importance of being ready to change the arrangements where shortcomings become apparent.
- This Report confirms the importance of government programs to help small-to-medium businesses better understand how they can take full advantage of the opportunities provided by a national broadband network.



Heather Ridout
Chief Executive
Australian Industry Group

¹ Australian Bureau of Statistics, 5625.0, *Private New Capital Expenditure and Expected Expenditure*, Australia, September 2011.

Deloitte



The key findings of the Australian Industry Group National CEO Report, exclusively sponsored by Deloitte, are that by investing in new technologies Australian businesses are becoming more productive, as well as more innovative, competitive and smarter, particularly with how they engage with customers.

Survey responses unanimously indicate that the internet impacts positively on productivity. So grasping this change agent with both hands and understanding its value, is imperative.

Deloitte research shows that the direct contribution of the internet to the Australian economy is set to increase by \$20 billion over the next five years from \$50 billion to roughly \$70 billion. This represents a growth rate of 7%, twice that forecasted for the rest of the economy. It is also forecasted that an additional 80,000 Australians will be employed in areas directly related to the internet.

However, there still appears to be a gap, with only 30% of businesses in this survey reporting they have a high or medium degree of information about the practical impacts of the faster broadband speeds to be delivered by the National Broadband Network (NBN).

The value of this world-leading broadband network will only translate into the projected competitive edge if businesses are ready to quickly and fully partake of the opportunities, applications and services once the NBN is in place. This, therefore, needs knowledge, skill, investment and courage.

As mobility continues to grow as a preferred mode of access by consumers and employees for all sorts of services and increasingly products, getting a grip on the potential of these new technologies to understand who your consumers are, how they behave and then what this means, and so re-think some products and services is very important.

The amount of information we as consumers publish on the Internet via the social media channels of Facebook, Twitter, LinkedIn, or YouTube has sky rocketed, with statistics pointing to such consumer and business data growing exponentially through these channels over the next five years – at faster rates than the adoption of television or even the internet.

This means that our capacity to tag and measure anywhere, anytime and across multiple channels has never been more important. While these many sources are all interesting as standalone sources of insight, when combined, they enable businesses to see patterns and opportunities they may well have never picked up.

A key reason for businesses in the survey investing in new technologies, particularly in the services sector, is to better manage this explosion of data. However the danger is that businesses might very well miss the opportunity if they do not move forward on the capability front.

Our Government's efforts to subsidise, support and supply industries with the ingredients needed to make technology not just a driver of productivity, but a source of export demand, means that the R&D and other programs need to be getting traction at much greater levels.

The 2011 Australian Industry Group National CEO Report, exclusively sponsored by Deloitte, tells us that many technologies are now becoming mainstream in the surveyed sectors and leveraged not just as a source of innovation or advancement, but as a "ticket to play." With this in mind businesses must:

- Consider how and where in the world technologies are disrupting their industry or supply chain
- Understand where technology can be deployed to provide growth and efficiency
- Ensure they have adequate technology and digital media knowledge and expertise at, or feeding the most senior levels of their business.

Taking these strategies on board will enable businesses to meet one of the 2020 National Digital Economy Strategy goals for Australia to rank in the top five OECD countries in the portion of businesses using online opportunities to drive productivity improvements, expand their customer base and enable job growth.

A handwritten signature in black ink, appearing to read 'D. Tampling'.

Damien Tampling

Technology, Media and Telecommunications Leader
Deloitte

Executive Summary

This report explores business investment in new technologies. It is based on a survey of 540 Chief Executive Officers of Australian businesses in the manufacturing, services and construction sectors. The survey focused on business investment in new technologies over the past three years; on business use of R&D tax incentives and on expectations about the new approach to business R&D incentives introduced by the Federal Government in the middle of 2011. The survey also examines how businesses are placed to take advantage of a national broadband network and online technologies more generally.

By exploring these issues, the report aims to inform businesses and aid policy makers in their efforts to stimulate business investment in new technologies and achieve productivity growth, and to ensure the potential of a national broadband network is fully realised.

Australian businesses operate in a global market place. The competitive pressures faced from both domestic and foreign sources require businesses to continually improve their productivity. One key strategy businesses are using to achieve this is investing in new technologies. Close to 80 per cent of respondents to this survey reported making investments in new technologies over the last three years. For these businesses, productivity and goods & services innovation were the two most common reasons for their investment.

Just over 70 per cent of businesses that invested in new technologies over the past three years reported that they did so in order to improve productivity levels. This investment in new technologies is reported to have accounted for an average of 16 per cent of the productivity gains achieved by these businesses over the past three years. In addition to productivity and innovation, data management, improving workplace safety, and reducing exposure

to labour costs were common reasons for businesses investing in new technologies.

Far from simply relying on 'off the shelf' technologies, businesses are actively engaged in developing new technologies to meet their specific needs. Over one-quarter of businesses that invested in new technologies over the past three years did so in conjunction with internal R&D.

The main form of government assistance available to businesses conducting internal R&D over the past three years has been the R&D Tax Concession, which recently changed to the R&D Tax Incentive. While the R&D Tax Concession has provided valuable support for a number of businesses, a significant proportion of respondents reported that they did not take advantage of the program. Of those businesses that have used R&D tax concessions over the past three years, close to 30 per cent expect the changes to the definition of eligible expenditure would negatively affect their business. As a result, Ai Group believes that the new R&D Tax Incentive should be closely monitored and that the Federal Government should be ready to respond to any shortcomings that become apparent.

Businesses are most commonly finding out about new technologies from their employees and other businesses within their supply chain. Close to 70 per cent of businesses that invested in new technologies over the past three years reported that the information source came from within their business or their supply chain. External consultants are also a common source of information for business.

For the overwhelming majority of businesses there is no connection between their investments in new technologies and public sector research institutions. Less than 5 per cent of businesses reported that they obtained information about new technologies from research institutions and only 8 per cent of all businesses, and 6 per cent of manufacturers, collaborated with public sector research institutions as part of their investment in new technologies over the past three years.

These findings suggest that better and more industry-driven arrangements could be put in place to drive greater levels of collaboration between publicly funded research organisations and businesses. This

should be given a high priority, including as part of the work in train as part of the Prime Minister's Taskforce on Manufacturing.

Businesses also identified whether they were ready to take advantage of the opportunities, applications and services that will arise from a national broadband network. Only 30 per cent of businesses reported that they had a high or medium degree of information about the practical impact of faster broadband speeds, while just over 50 per cent of businesses reported that they were, to a high or medium degree, confident of their readiness to take advantage of the opportunities, applications and services that will arise once a broadband network is in place.

Confidence among small businesses and businesses located in regional and rural areas was found to be particularly low. These findings confirm the scope to assist small and medium enterprises better understand how they can take full advantage of the opportunities provided by a national broadband network.



Section 1

Introduction

This report examines investment by Australian businesses in new technologies.

The next section examines a series of questions related to investment in new technologies (as distinct from simply replacing existing technology) by Australian businesses in the manufacturing, services and construction sectors over the past three financial years. Technology for the purposes of this report is broadly defined to include assets such as computer software, machinery & equipment and telecommunication equipment, and technologies purchased either externally or developed internally through research and development. The section examines the extent of investment in new technologies; the types of technologies adopted; how the technologies are acquired; where businesses source information about new technologies; the reasons for the investments; their impact on productivity and the variety of factors that have helped or hindered business investment in new technologies.

The third section looks specifically at the role of the R&D Tax Incentive, including business use of this program and, in light of its recent remodelling, business expectations about the impact of the changes to support for business R&D in Australia.

The fourth section of the report focuses on broadband. In 2010, the Federal Government released the National Digital Economy Strategy that is intended to help maximise the opportunities stemming from a new national broadband network.² One of the goals of the Strategy was that by 2020, Australia would rank in the top five OECD countries for the proportion of businesses using online opportunities to drive productivity improvements, expand their customer base and enable jobs growth. Three years on from Ai Group's initial report into business use of broadband technologies, *High speed to broadband: measuring industry demand for a world class service*³, this section revisits how businesses are using online technologies and how



they are positioned to take advantage of a new national broadband network.

The final section of the report outlines the policy implications of the findings of this survey with a particular focus on how policy can encourage greater and more effective investment in new technologies by Australian businesses and lift business use of digital technologies.

The findings of the survey are based on the responses of 540 businesses from across the manufacturing, services and construction sectors. Details of the sample used for this report are shown in Table A1 at the end of the report.

Respondents were classified into small, medium and large businesses on the basis of the number of their employees. Small businesses have fewer than 20 employees, medium-sized businesses have between 20 and 99 employees while businesses with 100 employees or more are classified as large for the purpose of this report. Respondents were also classified into "high," "medium" and "low" performing businesses on the basis of the growth in their turnover of the past three years. Businesses were regarded as low performing if their turnover growth was less than five per cent, medium performing if turnover growth was greater than five but less than 15 per cent and high performing if growth of turnover was 15 per cent or above.

² Department of Broadband, Communication and the Digital Economy, *National Digital Economy Strategy*, 2011.

³ Australian Industry Group/Deloitte, *High speed to broadband: measuring industry demand for a world class service*, 2008.

Section 2

Business Investment in New Technologies

This section explores investment by Australian businesses in new technologies (as distinct from simply replacing existing technology) over the past three financial years. Technology is broadly defined to include a range of assets such as computers, software, machinery & equipment and telecommunication systems, and includes technologies acquired externally or developed internally through research and development.

How much have businesses invested in new technologies?

Respondents spent an average of 21 per cent of their total investment expenditure over the past three financial years on new technologies. Over this period, total investment expenditure of Australian businesses in the manufacturing, services and construction sectors totalled close to \$370 billion⁴ across a range of assets including buildings, machinery & equipment and intellectual property.

Extrapolating from these results suggests that total spending on new technologies by the Australian manufacturing, services and construction sectors has averaged close to \$25 billion per year since 2008/09.

Businesses in the manufacturing and service sectors spent an average of close to 22 per cent of their total investment expenditure on new technologies over the past three financial years, on average approximately 10 percentage points higher than businesses in the construction sector. For the manufacturing and service sectors, this translated to approximately 15 and 20 per cent of gross operating profits respectively, while investment in new technologies within the construction sector totalled just over 5 per cent of gross operating profits (Table 1).

Investment in new technologies, measured as a proportion of total investment expenditure, tends to increase with business size and performance.

The average proportion of investment expenditure spent on new technologies by large businesses over the past three financial years was just under 30 per cent, close to 10 percentage points higher than for small businesses. Similarly, high performing businesses spent 28 per cent of their investment expenditure on new technologies, close to 8 percentage points higher than low performing businesses (Table 2).

Sector	Average proportion of total investment expenditure (%)	Proportion of gross operating profit (%)*
Manufacturing	21.9	15.4
Services	22.1	20.7
Construction	13.6	5.4
Total	21.1	18.0

*ABS, 5204.0, Australian System of National Accounts, Australia, 2010-11.

Size	Average proportion of total investment expenditure (%)
Small	18.2
Medium	21.2
Large	29.7
Performance	
High	27.6
Medium	17.0
Low	20.7

⁴ Australian Bureau of Statistics, 5204.0, Australian System of National Accounts, Australia, 2010-11.

Table 3. Types of New Technologies				
Per cent of investors in new technologies				
	All respondents	Manufacturing	Services	Construction
Computer hardware	47.1	40.2	65.0	54.8
Other machinery & equipment	35.8	40.5	24.3	35.5
Automation or control equipment	19.5	23.2	9.3	16.1
Other software	19.3	17.0	25.7	16.1
Electronics and systems integration	15.2	13.6	21.4	6.5
Telecommunications equipment	10.4	5.1	23.6	6.5
E-commerce software	10.4	10.5	9.3	12.9
Instrumentation	15.2	11.3	23.6	19.4
Telecommunications systems	8.7	7.1	14.3	0.0*
Robotics	5.9	8.2	2.1	0.0*
Security and surveillance	4.3	2.8	7.1	6.5

*None of the construction businesses surveyed reported investing in telecommunications systems or robotics.

What types of new technologies have businesses invested in?

Businesses ranked the technologies listed in Table 3 according to how much they invested in them over the past three financial years. Each category of technology is associated with a figure which represents the proportion of businesses that ranked that technology in their top 3 investments.

Over the past three years the most common types of technologies invested in have been computers, automation & control equipment and other machinery and equipment.

Close to 50 per cent of businesses that reported investing in new technologies over the past three years reported investing in computer hardware. Just over one-third of businesses have invested in “other machinery & equipment.” Close to 20 per cent of businesses invested in automation or control equipment and “other software,” and around 15 per cent invested in electronics & system integration.

Just over 15 per cent of businesses invested in instrumentation, slightly more than 10 per cent invested in e-commerce software over the past three years, with 6 per cent of businesses investing in robotics and 4 per cent investing in security and surveillance equipment or software.

Investment patterns have varied by sector, with a relatively large proportion of manufacturing businesses investing in automation or control equipment and

robotics, while businesses in the services sector were more likely to invest in computer software, telecommunications equipment, and electronics and systems integration.

How have new technologies been acquired?

Businesses can acquire new technologies in a number of different ways. For example, a business can purchase technology from an external supplier, develop new technologies through internal R&D, or in collaboration with an external research organisation. Technology purchased from an external supplier can fall under two categories (i) a generic ‘off the shelf’ product or (ii) a product that has been adapted to meet the specific needs of a business. Table 4 summarises how common each of these investment methods have been.

The most common way businesses are investing in new technology is through acquisition from an external supplier. Far from simply relying on ‘off the shelf’ technologies however, businesses purchasing new technologies were just as likely to report that the technology had been adapted to meet the specific needs of their business.

Larger businesses, in particular, have been less likely to rely on generic ‘off the shelf’ technologies, and have instead developed technologies through internal R&D and/or have purchased technologies that have been adapted to meet the specific needs of their business.

Table 4. How New Technologies were Acquired					
Per cent of investors in new technologies					
	Purchased externally		Developed internally	Acquired as a result of collaboration with research organisations	Other*
	Off the shelf	Adapted			
Sector					
Manufacturing	45.2	42.2	25.7	6.5	0.0
Services	39.3	52.5	24.6	10.7	0.8
Construction	45.5	31.8	27.3	9.1	0.0
Size					
Small	45.3	37.8	21.6	8.1	0.0
Medium	45.9	46.9	25.8	7.2	0.0
Large	35.7	51.4	35.7	8.6	1.4
Performance					
Low	42.5	46.0	25.3	11.5	0.0
Medium	45.0	39.5	29.4	8.3	0.0
High	46.7	47.6	28.6	5.7	1.0
Total	43.7	44.6	25.7	7.9	0.2

*One business reported that they obtained new technologies after acquiring another business. Some businesses nominated more than one mode of acquisition.

Of the businesses that have invested in new technologies over the past three financial years, close to 25 per cent developed new technologies internally through research and development. Only 8 per cent reported that their acquisition of new technologies occurred as a result of collaboration with research organisations.

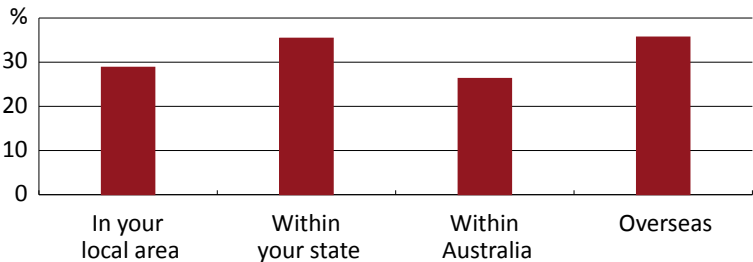
The proportion of manufactures collaborating with research organisations was found to be relatively low compared to businesses in the services and construction sectors.

Businesses that purchased new technologies from an external supplier over the past three financial years identified where the supplier was located.

A high proportion of businesses reported not just sourcing technologies from external suppliers in their local area, but from interstate and/or overseas suppliers.

For example, close to one-third of businesses reported they had purchased new technologies from businesses located overseas, while around one-quarter of businesses reported they had purchased technology from an interstate supplier (Chart 1).

CHART 1. Location of External Suppliers
Per cent of businesses that purchased new technologies from an external supplier



How are businesses learning about new technologies?

In order to gain a sense of how information about new technologies is disseminated through the economy, businesses described how they found out about the technologies they invested in over the past three years.

Close to 70 per cent of businesses that invested in new technologies over the past three years reported sourcing information from within their own business or from their supply chain – for example from a supplier of capital equipment.

The remaining businesses reported learning about the new technology through a contractor or an organisation outside the supply chain, such as a research institution or industry association.

Close to 12 per cent of businesses that internally developed new technologies initially found out about the technology through a research institution.

Just under 50 per cent of businesses reported that they learnt about the new technologies they invested in from a client or supplier (Chart 2), suggesting the important role supply chains play in the diffusion of knowledge. The next most common sources of information are the internet or journals and employees.

Close to 25 per cent of businesses reported that information about new technologies had come from an external consultant, while only 15 per cent of businesses reported they had directly learnt about the new technologies they invested in through external seminars or conferences. Overall, less than 5 per cent of businesses reported that they directly sourced information from research institutions or from government.

As would be expected businesses that developed new technologies in-house were significantly more likely to identify their own employees as their source of information about new technologies (49 per cent compared with 27 per cent for businesses that invested in new technologies but did not develop these internally). Interestingly, businesses that did develop technologies internally were also significantly more likely to identify research institutions as a source of information (12 per cent as compared with 3 per cent of businesses that did not develop technologies internally).

Chart 3 presents this information in a slightly different way: ‘Employees’ and ‘internet or journal’ are classified as ‘internal’ sources of information i.e. ideas or research that has come from staff; ‘clients or suppliers’ and ‘other businesses’ are classified as ‘market’ sources of information; while ‘industry associations’, ‘research institutions’ and ‘government’ are classified

CHART 2. Sources of Information about New Technologies

Per cent

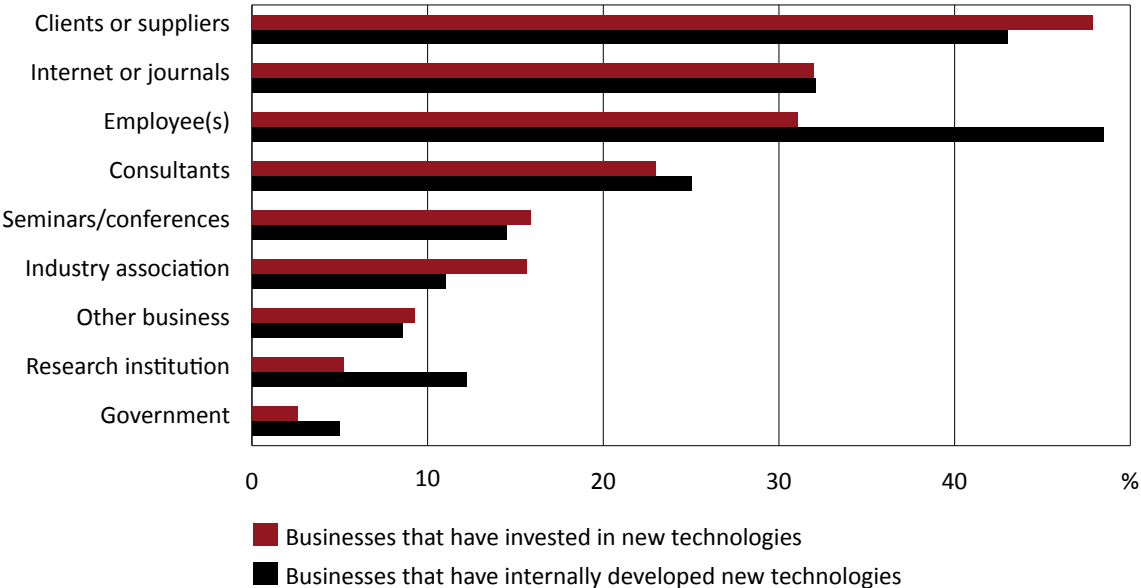
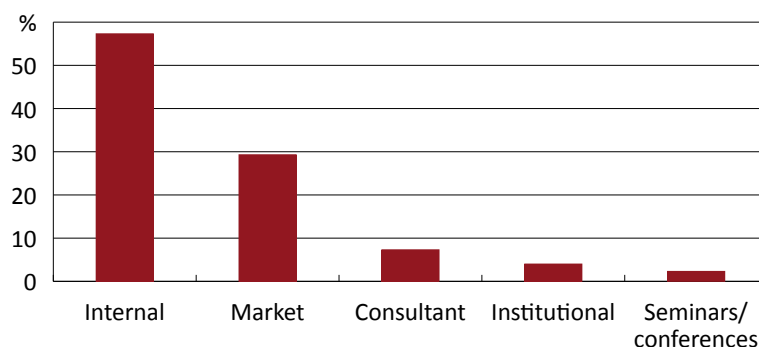


CHART 3. Sources of Information about New Technologies

Per cent of investors in new technologies



as ‘institutional’ sources. Presented this way, the data highlights the importance of staff as a key source of information about new technologies, while institutions, such as industry associations, research institutions and government have been a relatively limited direct source of information for business about new technologies. There is clearly scope for a greater effort on the part of research institutions in the dissemination of information to a broader cross-section of businesses.

Why are businesses investing in new technologies?

By far and away the most common reason for businesses investing in new technologies over the past three years has been to increase productivity levels.

Goods and services innovation has been another important reason for business investment in new technologies (Table 5); close to 54 per cent of businesses investing in new technologies over

Table 5. Reasons for Investment in New Technologies

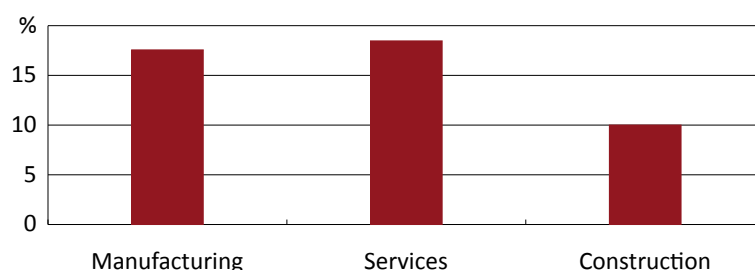
Per cent of investors in new technologies*

	Total	Manufacturing	Services	Construction
Increase productivity	71.6	72.9	70.7	54.5
Improve existing products	39.8	45.5	33.3	18.1
Data management	37.4	28.5	56.9	36.3
Expand production	36.1	43.6	20.3	40.9
As part of the development of new products	32.3	35.5	29.2	9.0
Improve workplace safety	23.4	26.2	13.0	40.9
Reduce exposure to labour costs	22.7	25.4	18.7	13.6
Seek faster internet speeds	14.7	10.4	21.1	22.7
Improve energy efficiency	13.7	13.9	12.2	9.0
Up-skilling and training	11.3	7.3	17.8	18.1
Comply with government regulation	10.8	9.6	13.0	13.6
Manage skill shortages	8.0	9.2	5.6	9.0
Reduce non-greenhouse environmental impacts	6.3	5.7	7.3	0.0
Reduce direct emissions of greenhouse gases	5.1	5.7	4.0	4.5

*Businesses were able to select multiple reasons for their investment. As a result, the numbers in the table will not sum to 100.

CHART 4. Productivity Gains Attributable to New Technologies

Per cent of investors in new technologies



the past three years did so in order to improve existing products or develop new products. Data management was also a key reason for investment, particularly among services sector businesses.

The relatively high proportion of businesses citing safety as a reason for investing in new technology is a clear demonstration of the seriousness with which workplace safety is taken by business. Improving workplace safety was ranked by over 40 per cent of construction businesses and just under 30 percent of manufacturers as a reason for their investment in new technologies over the past three years.

Just under 15 per cent of businesses reported investing in new technologies in order to achieve faster internet speeds.

In comparison, a relatively low proportion of businesses reported that reducing environmental impacts or more specifically reducing emission of greenhouse gases as reasons for investment in new technologies over the past three years.

What has been the impact on productivity levels?

Given that the most common reason for investing in new technologies has been to increase productivity levels, businesses estimated the proportion of their productivity gains over the past three financial years attributable to the introduction of new technologies.

Businesses estimate that new technologies accounted for around 16 per cent of their productivity gains.

Manufacturing and service businesses investing in new technologies estimated that these investments had accounted for approximately 17 per cent of their productivity gains over recent years, while construction businesses estimated that the figure was closer to 10 per cent (Chart 4). These results accord with the level of investment in new technologies, as measured by the share of total investment expenditure, that has been made by these sectors over recent years (see above).

Clearly investing in new technologies is just one of many strategies businesses adopt in order to improve business performance and productivity levels. In a recent Ai Group survey of manufacturing members for instance, businesses identified a range of strategies they planned to adopt over the next three years. Table 6 lists the

Table 6. Firm Level Strategies	
Strategy	Net balance Per cent
Improve efficiency of production processes	84
Introduce new products and services	76
Improve supply chain management	60
Introduction of new technology	56
Raise spending on skills development	35
Greater investment in existing technologies	26
Greater spend on R&D	21
Establish new distribution channels	19

Source: 2011 Ai Group survey of manufacturing businesses.

leading eight strategies identified by respondents and a 'net balance' figure is associated with each strategy. This is a summary statistic that shows the proportion of businesses that thought they would pursue a given strategy less the proportion of firms that thought it was unlikely. The higher the net balance figure the more common each strategy is likely to be adopted across businesses in the Australian manufacturing sector.

Investing in new technologies, by either introducing new technologies into the workplace or increasing investment in R&D, feature among the leading strategies along with a range of other productivity-enhancing strategies including improving the efficiency of production processes, increasing skills development, improving supply

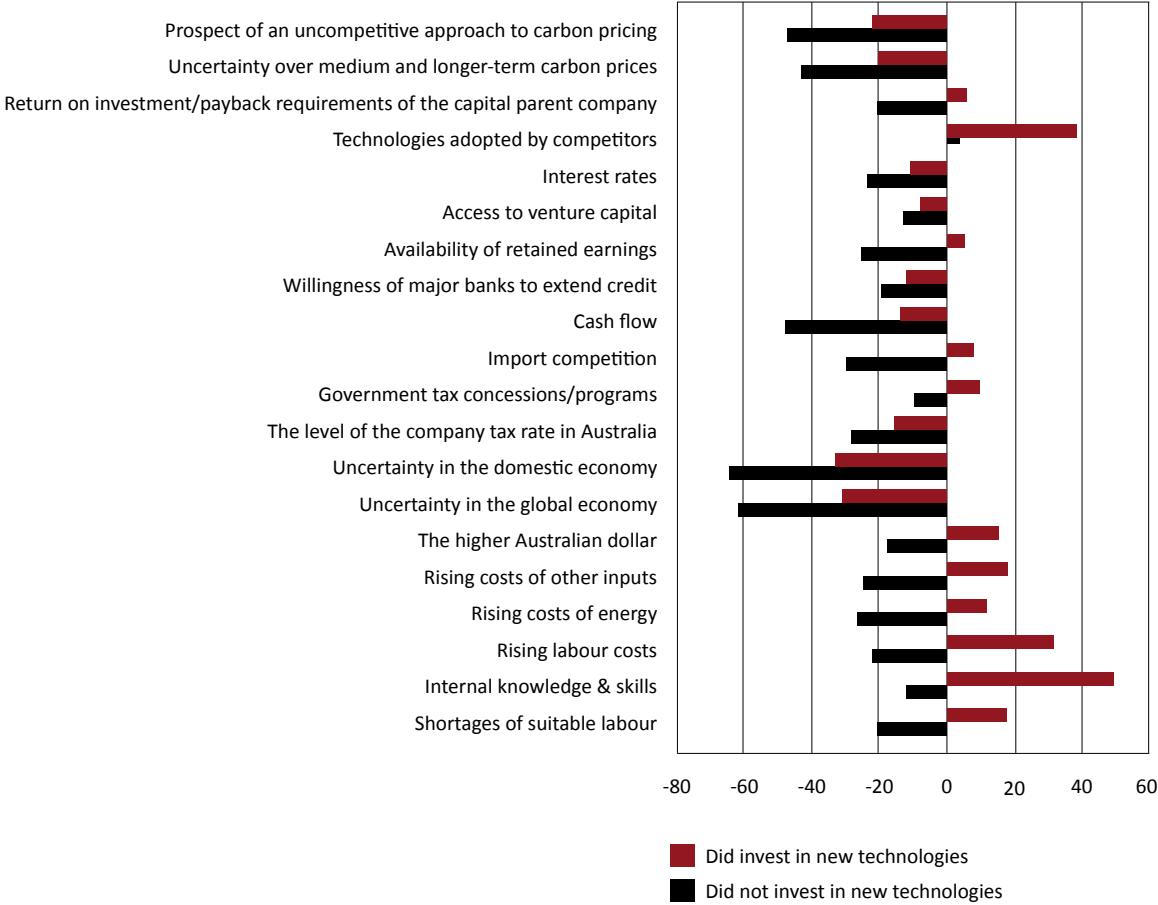
chain management, introducing new products or services, and greater investment in other capital equipment besides new technologies.

What factors have influenced Australian business investment in new technologies?

All businesses, regardless of whether they had invested in new technologies over the past three years, ranked the extent to which the factors listed in Chart 5 had affected their investment decisions.

In Chart 5, the responses of businesses that did invest in new technologies over the past three years are compared to the responses of businesses that did not invest in new technologies. The responses of these two groups are summarised using 'net balance' figures, which show the proportion of

CHART 5. Factors Influencing Investment in New Technologies
Net balance



businesses that thought a given factor supported investment decisions less the proportion of firms that thought it had weighed against investment decisions. Thus, a large net balance figure indicates that a relatively high proportion of businesses, on balance, reported that a particular factor weighed in favour of their investment decisions.

Among businesses that did invest in new technologies, the highest scoring spur to investment in new technologies was the internal knowledge and skills in the business. In contrast, for businesses that did not invest in new technologies, a lack of internal knowledge and skills, on balance, detracted from their ability to invest in new technologies.

Uncertainties over the global and domestic economic outlook, and in relation to climate change policies, have been the most significant impediments to investment over the past three years, particularly for those businesses who did not invest.

Businesses that did not invest in new technologies were also more likely to report that the likelihood of an uncompetitive domestic carbon price, the availability of funds (whether through cash flow, retained earnings or credit), and the relatively high company tax rate in Australia had impeded investment decisions.

Rising input costs and the higher exchange rate were further identified factors that have reduced the ability of these businesses to invest.

In contrast, businesses that did invest in new technologies over the past three years reported that these rising costs had provided strong incentives to adopt new technologies in order to improve efficiency.

Both groups reported that, on balance, the technology adopted by their competitors has been a positive factor in their investment decisions.

Section 3

The Research and Development Tax Incentive

To what extent are businesses taking advantage of government tax concessions?

Businesses developing new technologies through internal R&D can apply for support in the form of a tax incentive provided by the Federal Government. Prior to 1 July 2011, the Federal Government’s R&D Tax Concession program allowed companies to deduct up to 125% of qualifying expenditure incurred on R&D activities when lodging their corporate tax return.

More recently, the R&D Tax Concession has been replaced by the R&D Tax Incentive which has two core components:

- a 45 per cent refundable tax offset to eligible entities with an aggregate turnover of less than \$20 million per annum
- a non-refundable 40 per cent tax offset to all other eligible entities

Businesses identified how important they believed R&D tax concessions had been to their business and what, if any, impact the new R&D Tax Incentive program would have on their investment in new technologies through R&D.

Overall, R&D tax concessions have been moderately or very important for close to one-quarter of the businesses that invested in new technologies over the past three years (Chart 6).

*Interestingly, of the businesses that have internally developed new technologies over the past three years, 42 per cent have done so **without** the assistance of government R&D tax concessions.*

CHART 6. Importance of R&D Tax Concessions
Per cent

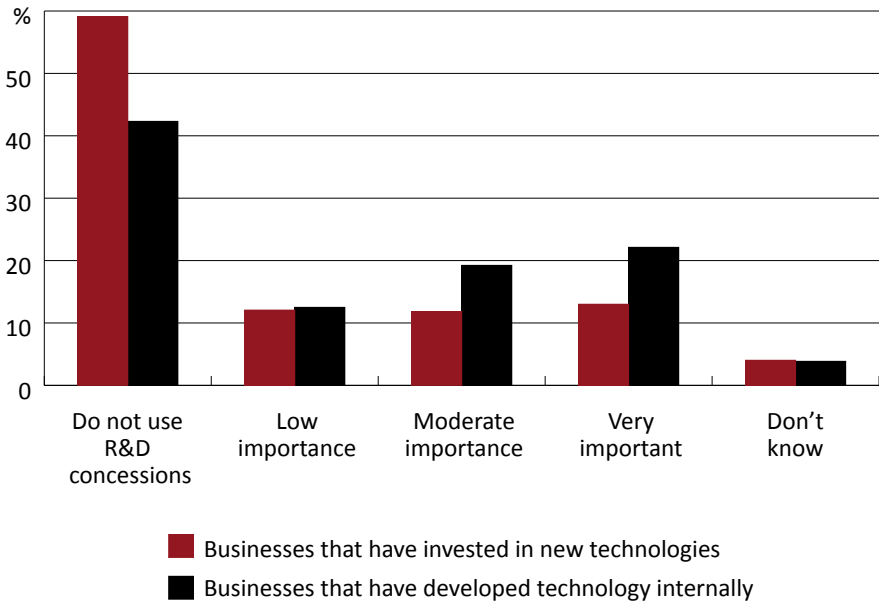
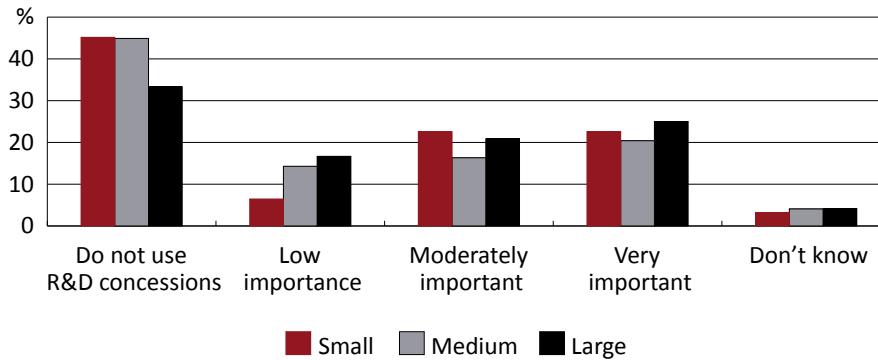


CHART 7. Importance of R&D Tax Concessions
Per cent of businesses that have internally developed new technologies



Close to 40 per cent of businesses that had developed new technologies internally reported that R&D tax concessions have been moderately or very important for their business.

Larger businesses that have been involved in internally developing new technologies have tended to find R&D tax concessions more important than smaller businesses (Chart 7).

How does government assistance of business R&D in Australia compare to other OECD countries?

The latest data from the OECD shows that in 2009, government assistance of business R&D activity in Australia totalled just over 0.1 per cent of GDP. This was relatively low compared to other OECD countries and for the OECD as a whole the average level of government assistance was around 0.18 per cent of GDP (Chart 8).

CHART 8. Government Funding of Business R&D 2009
Per cent of GDP

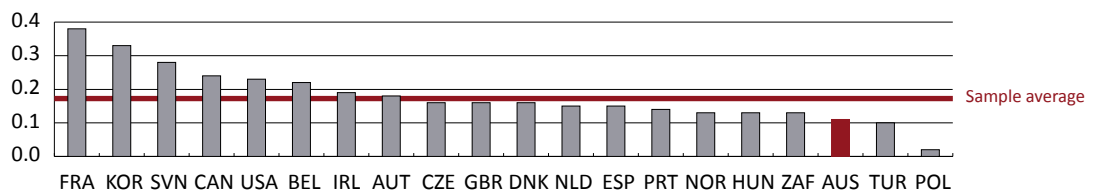
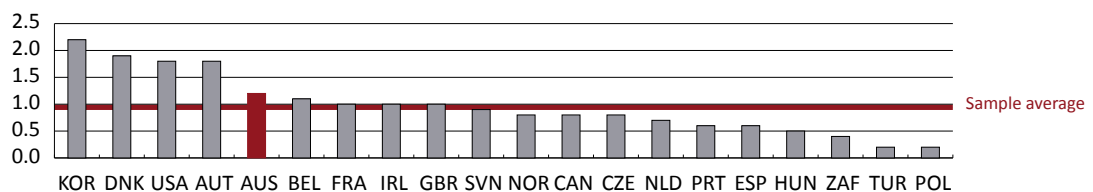


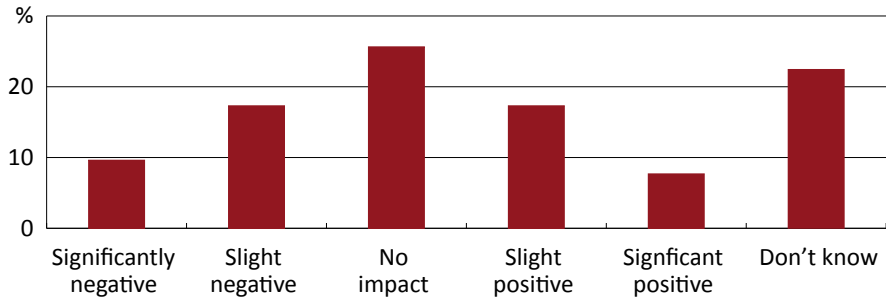
CHART 9. Business R&D Expenditure less Government Contributions 2009*
Per cent of GDP



*Government contributions include direct government funding of business R&D and tax incentives for R&D.
Source: OECD Science, Technology and Industry Scoreboard 2011.

CHART 10. Expected Impact of Changes to R&D Tax Concessions

Per cent of businesses that have used R&D tax concessions



The relatively low level of government support was not due to the comparatively low level of R&D expenditure by Australian businesses. While business R&D spending (including government assistance) as a proportion of GDP is still below the OECD average despite a period of relatively high growth in Australia, net business expenditure on R&D (i.e. not including government grants or tax expenditures allocated to business in support of R&D) is now higher than the average for the OECD as a whole (Chart 9).

What expectations do businesses have of the new R&D Tax Incentive?

Australian businesses have sharply divergent views on the impacts on their business of the new R&D Tax Incentive.

Around 25 per cent of businesses that used the former R&D tax concession, indicated that the new arrangements would not have an impact on their business (Chart 10).

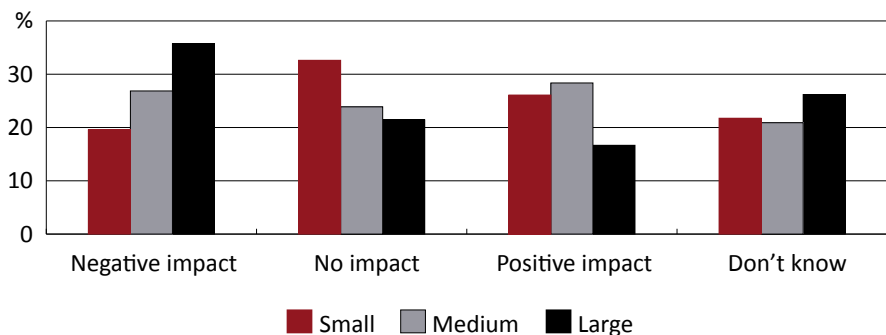
A further 25 per cent of these businesses expect the new R&D Tax Incentive to have a positive impact on their business and just under 30 per cent expect the changes to negatively affect their business.

Another 22 per cent were uncertain about the impact of the changes on their business.

Of those businesses that have used R&D tax concessions over the past three years, larger businesses were somewhat more likely to expect the recent policy changes to have a negative impact on their business (Chart 11).

CHART 11. Expected Impact of Changes to R&D Tax Concessions

Per cent of businesses that have used R&D tax concessions



Section 4

Business Use of Online Technologies

In 2008 Ai Group published the report: *High speed to broadband: measuring industry demand for a world class service*⁵. One of the key findings of the report was that ‘a significant proportion of businesses are failing to utilise the full potential of existing online technologies, with others remaining in the dark over what high speed broadband can do to benefit their business.’ In order to gauge the extent to which businesses have become better placed to take advantage of a new national broadband network, some questions from the 2008 survey were revisited.

How has the internet affected the productivity of Australian businesses?

Businesses were nearly unanimous in reporting that the internet has had a positive impact on their productivity levels.

Just under one-third of businesses reported that the internet has had a significantly positive impact on their productivity (Chart 12). Of the remaining businesses, the vast majority reported that the internet has had a positive impact on their productivity. These results are broadly in line with the responses of businesses to Ai Group’s 2008 broadband survey.

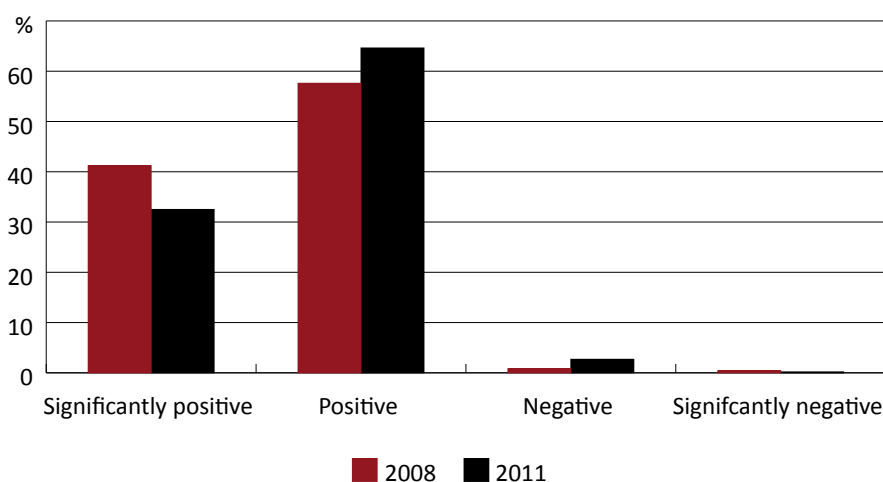
Businesses ranked how important the internet has been for the activities listed in Table 7. Each activity is associated with a figure which shows the proportion of businesses that reported that the internet was ‘very important’ for that activity.

Over 50 per cent of businesses reported that the internet was very important for financial activities (such as online banking), and exchanging data both within and outside the business.

50 per cent of businesses reported that the internet was very important for placing or receiving orders and close to 40 per cent of businesses also reported that the internet was very important for marketing.

Table 7 also suggests that governments and their agencies play an important role in shaping how businesses use the internet. For example, close to one-third of businesses reported that the internet is now very important for electronic lodgements such as licence applications. Standard Business Reporting

CHART 12. Impact of the Internet on Productivity
Per cent of all businesses



⁵ Australian Industry Group/Deloitte, *High speed to broadband: measuring industry demand for a world class service*, 2008.

	2011
Financial activities (e.g. online banking, invoicing)	76.8
Information/data exchange internal to your business	58.2
Information/data exchange with customers/businesses	58.0
Placing or receiving orders	50.0
Information gathering/researching (e.g. monitoring competitors)	43.5
Marketing (e.g. the company, products or services)	41.6
Electronic lodgements (e.g. licence applications)	31.3
Enabling staff to work from home or other locations	28.1
Global participation	27.0
Manufacturing processes (e.g. CAD)	24.7
Managing your supply chain	24.6
Product development	20.8
Training/learning	20.7
Reducing simulation times	8.0
Replacement of physical prototypes	7.9

(SBS) is just one example – SBS has already reduced the number of unique data elements required across 50 different financial government reports from 9,648 to 2,838.

Another opportunity that would benefit from more attention is the potential for environmental reporting to be harmonized across Australia. Reports on matters like pollutants, energy and water use, greenhouse emissions and so forth are currently made to a variety of different levels and agencies of government, often covering the same or similar data multiple times. Reporting through a single national online portal could cut the rising compliance cost of dealing with these systems, even without harmonizing substantive regulatory requirements.

Responses to the current survey suggest that the average proportion of turnover received via online orders is now above one-third.

While high performing businesses were found to have a slightly higher proportion of their turnover received via online orders (36 per cent) than low performing businesses (32 per cent) and service businesses receive a somewhat smaller proportion of orders online, the incidence of online orders was broadly similar across the sample (Table 8). This is suggestive of the increasingly important role of e-commerce.

Sector	
Manufacturing	36.6
Services	30.9
Construction	38.2
Size	
Small	36.1
Medium	34.2
Large	34.2
Performance	
High	35.7
Medium	36.1
Low	31.8
Total	35.0

Sector	High	Medium	Low	None at all
Manufacturing	6.4	17.5	44.0	32.1
Services	12.7	32.1	31.3	23.9
Construction	7.4	29.6	40.7	22.2
Size				
Small	7.9	19.6	36.5	36.0
Medium	7.6	21.1	43.1	28.3
Large	8.1	33.8	44.6	13.5
Total	8.1	22.1	40.5	29.3

Are businesses well placed to take advantage of a national broadband network?

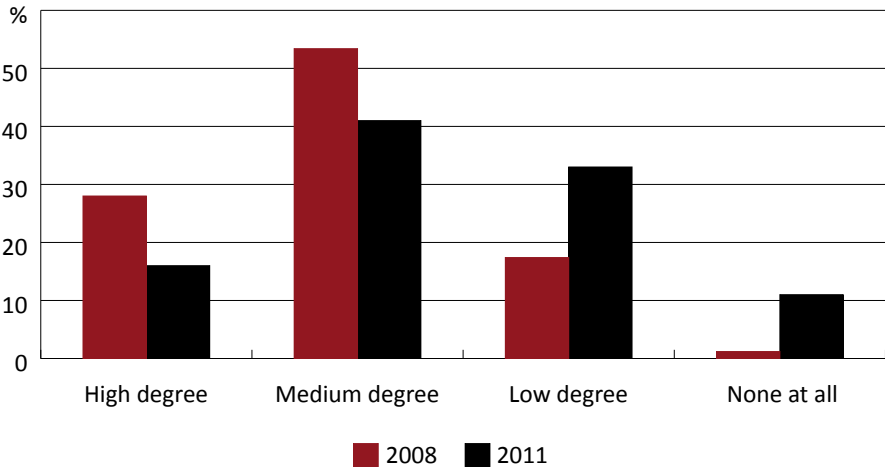
Notwithstanding some efforts, only 30 per cent of businesses reported they had a high or medium degree of information about the practical impact of faster broadband speeds. Larger businesses were much less likely to report having no information about the practical impacts of broadband and small and medium-sized businesses were clearly less likely to report having a high or medium level of information about practical impacts of broadband (Table 9).

Businesses identified the degree to which they have the skills/capabilities to take advantage of the

opportunities, applications and services that will arise once a broadband network is in place.

Close to 55 per cent of businesses reported that they, to a high or medium degree, currently have the skills/capabilities to take advantage of a new national broadband network. This compares to close to 80 per cent of businesses in 2008 (Chart 13). This finding may suggest that as businesses have become more aware of the opportunities and applications that will become available to them once the broadband network is in place, they have become significantly less confident that they are presently able to take full advantage of them.

CHART 13. Do Businesses have the Capability to Take Advantage of a New Broadband Network?
Per cent



Sector	High	Medium	Low	None at all
Manufacturing	12.0	41.4	35.3	11.4
Services	24.4	37.8	27.4	10.4
Construction	17.9	50.0	28.6	3.6
Size				
Small	13.4	38.6	33.0	14.8
Medium	13.8	45.5	33.9	6.7
Large	24.3	36.4	31.0	8.1
Location				
Capital city	16.3	39.2	32.0	12.4
Other urban	16.7	38.1	36.9	8.3
Regional	15.7	45.1	31.4	7.8
Rural	3.9	50.0	38.5	7.7
Total	15.6	40.8	32.9	10.6

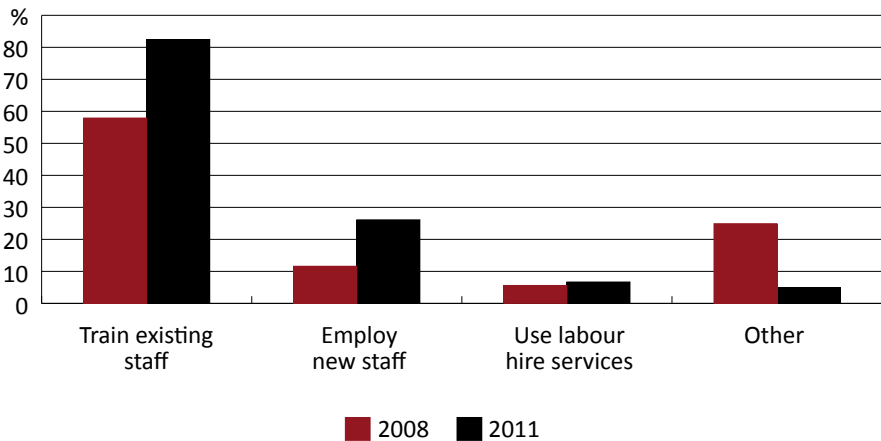
In particular, a relatively low proportion of small businesses, and businesses located in regional and rural areas, believed they were currently ready and able to take advantage of a new broadband network. Close to 41 per cent of regional and rural businesses reported that they were, to a low degree or not at all, ready to take advantage of the opportunities, applications and services that will arise once broadband network infrastructure is in place (Table 10).

Businesses foreshadow up-skilling employees to take advantage of a new broadband network.

Over 80 per cent of businesses intend to train existing staff in order to improve the skills/capabilities required to take full advantage of a new broadband network.

Close to 25 per cent of businesses also reported they would consider hiring additional staff to improve their ability to take advantage of the opportunities, applications and services that will arise once a broadband network is in place (Chart 14).

CHART 14. Strategies to Prepare For a National Broadband Network
Per cent



Section 5

Policy Implications

This report highlights a number of areas for policy action to stimulate investment in new technologies.

1. Improving the competitiveness of tax arrangements by lowering the company tax rate or through more targeted measures is a practical way that the Federal Government can help stimulate business investment in new technologies.

Businesses reported that the relatively high Australian company tax rate was an impediment to investment. This was particularly the case for businesses that did not invest in new technologies over the past three years.

2. Developing better industry-driven mechanisms for collaboration between publicly funded research organisations and businesses should be given a high priority, including in the Prime Minister's Taskforce on manufacturing.

Less than 5 per cent of businesses reported that they directly sourced information from research institutions, while only 8 per cent of all businesses and 6 per cent of manufacturers that invested in new technologies over the past three years did so through collaborating with research organisations. The low level of collaboration between public sector research organisations and businesses that do not have their own in-house R&D capabilities stands out as an area where particular efforts can be made to provide accessible information to a broader cross-section of businesses.

3. There is strong scope for governments to improve the dissemination of information about new technology for maximum impact to the economy.

Ai Group believes that there is a clear role for governments to help facilitate the dissemination of information about new technologies through the economy and provide best practice frameworks. One approach could involve encouraging 'cluster-type' activities that bring businesses together and encourage the transfer of knowledge. Governments could also act as a direct or indirect source of information for businesses. This Report highlights that more work can be done in both of these areas. Less than 5 per cent of businesses report that the government was a direct source of information about new technology.

4. The new R&D Tax Incentive needs to be closely monitored and the Federal Government should be ready to respond to any shortcomings that become apparent.

Over one-quarter of businesses that invested in new technologies over the past three financial years did so in conjunction with internal research and development. The main form of government assistance available to businesses conducting internal R&D over the past three years has been the R&D Tax Concession, which recently changed to the R&D Tax Incentive. While the R&D Tax Concession has provided valuable support for a number of businesses, a significant proportion of respondents expect to be negatively impacted by the new R&D Tax Incentive. In particular, of those businesses that have used R&D tax concessions over the past three years, close to 30 per cent expect the changes to the program will negatively affect their business. A further large proportion is unsure of the impact of the new arrangements.

Further, in light of the large numbers of businesses that report developing their own new technologies internally without assistance from the R&D tax incentive, every effort should be made to reduce the costs of compliance that may impede engagement in the scheme.

5. This Report confirms the importance of government programs to boost understanding by small-to-medium businesses in particular on the opportunities provided by a national broadband network.

Only 30 per cent of businesses reported that they had a high or medium degree of information about the practical impact of faster broadband speeds, while just over 50 per cent of businesses reported that they were, to a high or medium degree, ready to take advantage of the opportunities, applications and services that will arise once a world leading broadband network is in place.

The Federal Government's Digital Enterprise initiative is a first step towards meeting the goal set out in the Digital Economy Strategy of being in the top five OECD countries in relation to the proportion of businesses using online technologies. Reaching this goal will not be easy and further initiatives will no

doubt be required. Ai Group has previously suggested that a flagship five-year-plan is required to educate and support business – particularly in regional areas. This initiative could involve:

- top-down work with leaders in business, technology and research organisations to define the state of the art in knowledge of productivity and broadband;
- bottom-up work with individual businesses to assess their opportunities for and barriers to productivity-enhancing use of broadband; and
- accessible communication of the results to industry through existing business channels.

Ubiquitous broadband promises important opportunities for Australian businesses to build significant competitive advantage. Given that this is just the beginning of the digital age businesses need to be actively encouraged, supported and facilitated by government and research institutions.



Data Appendix

The findings of the National CEO survey are based on the responses of 540 businesses from across the manufacturing, services and construction sectors.

Respondents were classified into small, medium and large businesses on the basis of the number of their employees. Small businesses have fewer than 20 employees, medium-sized businesses have between 20 and 99 employees while businesses with 100 employees or more are classified as large for the purposes of this report.

Respondents were also classified into “high,” “medium” and “low” performing businesses on the basis of the growth of their turnover of the past three years. Businesses were regarded as low performing if their turnover growth was less than five per cent, medium performing if turnover growth was greater than five but less than 15 per cent and high performing if growth of turnover was 15 per cent or above.

Table A1. Sample Composition	
Per cent	
Sectors	
Manufacturing	67
Services	27
Construction	6
Location	
Capital city	59
Other urban	16
Regional	20
Rural	5
Size	
Small	42
Medium	44
Large	14
Performance	
Low	32
Medium	33
High	35



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