Legislative Assembly of Queensland – Economic Development Committee
Issues Paper No. 1 – July 2009

INQUIRY INTO IDENTIFYING WORLD'S BEST PRACTICE BY GOVERNMENTS TO EFFECTIVELY STIMULATE EMPLOYMENT OPPORTUNITIES IN QUEENSLAND.

Introduction

"Ultimately, it is firms that compete in the market and not countries. Therefore, it is necessary for them to become competitive by building abilities to acquire, assimilate, develop new technologies; reduce production costs; cut down delivery time; practice Total Quality Management; enhance productivity and customer service."[1]

This statement encapsulates the reason that QMI Solutions was established as a not-for-profit company by the Queensland Government and Queensland's two leading universities 16 years ago. It has established a reputation with industry and governments nationally as a leading exponent of improving competitiveness, innovation, skills and sustainability within small to medium manufacturing enterprises. Research within the Queensland manufacturing community confirms that SMEs view QMI as a trusted partner in improving their business performance.

In establishing the national Enterprise Connect network, Senator Kim Carr acknowledged that QMI Solutions was the model used for the national framework and also acknowledged the leading position taken by the Queensland government through its support of QMI Solutions.

In addition to being a significant employer in its own right, small to medium enterprise (SME) manufacturing is a key enabling sector for both mining and agriculture regionally.

QMI's role in supporting and developing manufacturing is focussed on practical hands-on activities in four primary areas:

- Competitiveness: Improving the performance of manufacturing SMEs through a variety of delivery mechanisms. QMI has championed the benchmarking of SMEs and provides a variety of hard and soft technology support to stimulate world's best manufacturing practices
- Innovation: Given that 98% of the world's R&D occurs outside Australia, QMI performs an important role in technology diffusion for SMEs. It regularly scans the world for both hard technologies and knowledge technologies appropriate to Queensland's manufacturing industries across most sectors. It then supports companies in both process and product innovation.
- Skills: Through its Manufacturing Skills Queensland (MSQ) division, QMI provides input and advice to government in relation to skills formation and skills development issues. It also leads and influences manufacturing and engineering industries in all skill related matters – from industry strategy and business process to smarter workforce management by providing direct

[1] *Indian National Manufacturing Competitiveness Council, Sep 2008*

support in workforce and organisational development, skills retention and advice on training development packages.

- Opportunity: The Industry Capability Network (ICN) division works with major infrastructure project Proponents and their Prime Contractors to identify tender opportunities and to maximise opportunities for local industry participation by competitive Queensland enterprises It operates at both policy level, through its implementation of key aspects of the state Local Industry Policy; and at the organisational level – supporting companies on a one-to-one basis to assess their capabilities to compete for major infrastructure projects. QMI can then offer tailored support in improvement activities.

QMI has measured the benefits of its support activities for a number of years and reports this annually to State Government.

QMI has responded to each of the issues in the Committee's paper from the perspective of its most relevant operating division.

Members of the Committee are invited to visit QMI to gain a deeper understanding of its operations. QMI staff would welcome the opportunity to present personally to the Committee if requested.

Issues for comment:

1. *How does Queensland ensure that opportunities for employment creation are maximized in existing industries?*

Strengthen existing support organisations

Industry Capability Network (ICN) is a key player in maximizing the potential for local industries to have full, fair and reasonable opportunity to compete for work on Queensland and Australian projects. Through the network of ICN organizations in each state and territory in Australia there is an existing organization that has a current view on the capability of the Australian manufacturing industry. In Queensland the state government has recently committed an additional $6.45M over 5 years to support and expand ICN(Qld) operations. Nationally the federal government has recently committed an additional $8.5M to further support ICN through additional Supplier Access to Major Projects (SAMP) grants. Through reported results ICN is able to demonstrate very significant value to the manufacturing industry. If ICN was expanded to support other industry sectors or a similar model applied to other organizations established for this purpose there would be a significant return in the form of increased local industry wins and corresponding employment. Some of the services which ICN provides which could be leveraged to other industry sectors are:

- Suppliers capabilities are registered on a national ICN database
- Supplier opportunities are published on the ICN website
- Major project opportunities and registrations are made available through Project Gateway portals for each major project.
- Major project opportunities are communicated to potential suppliers in regional Queensland through specific targeted seminars.
- With the support of SAMP funding, has established relationships in markets in Africa, New Caledonia and Papua New Guinea

Strengthen and support the Local Industry Policy

In Queensland the Local Industry Policy (LIP) is in place to ensure that projects which receive state government funding (> $5M or >$2.5M regionally) are required to consider and report on the level of local content achieved in the project. The implementation of the policy is managed through the Department of Employment, Economic Development and Innovation (DEEDI) and ICN (Qld) assist in the implementation of aspects of the LIP. While established with all the best intentions the effectiveness of the LIP is limited by how strongly it is enforced. As there are no penalties for non compliance, adherence to the LIP relies on a "good corporate citizen" response from the project proponents, contractors and subcontractors. Increasing the scrutiny on organizations that fail to comply with the LIP and providing recognition to those organizations that achieve outstanding levels of local content in their projects would help to raise the profile and effectiveness of the Local Industry Policy.

Support to Alliance formation

The Government's stimulus to the Queensland industry through a range of measures including the initiation of a number of infrastructure projects aimed at generating employment has a dependency on the ability of local companies to provide the desired employment. With the majority of manufacturing employment in Queensland linked to Small to Medium Enterprises (SMEs) there is a strong case for focusing on the success of Queensland SMEs in order to maximize the number of jobs created or retained. Short of establishing the requirement of for growth through providing funding, the Government has not established any new mechanisms to foster SMEs and enable them to maximize the proportion of the major project work captured. Due to the size of the work packages being released from the major projects a significant percentage of the work is beyond the capacity of SMEs to manufacture or construct within the required schedules. For a range of SMEs to meet the project requirements would take the formation of alliances with other SMEs with whom they have traditionally competed for smaller projects. These SMEs have limited understanding of the contractual and legal steps involved in the establishment of alliances, clusters or joint ventures and some targeted support for companies with information and training in this area would improve outcomes for SMEs, particularly in rural Queensland. This could enable the pooling of capability and expertise sufficient to be competitive where previously opportunities would have been missed.

Establishing Objective Measures of World's Best Practice

There is an expectation that Australia's support to Free Trade enables fair and reasonable opportunity for Australian manufacturers to compete with international companies for work on major projects, both domestically and internationally. The reality is that in many cases, Australian firms are unable to compete against imported supplies which can be landed in Australia at prices cheaper than they can be produced locally. This can be considered a sign that Australian firms are not internationally competitive without determining the specifics of the level of Government or industry support available to the international imports. There are numerous examples of foreign governments providing significant support to establish or foster industries to not only compete but potentially dominate on a world scale. In order for Australian firms to be compared against imports it is suggested that a full, objective measure of the full value proposition be established including a value stream map of the manufacturing steps of Australian versus imported supplies. This will establish how competitive Australian companies are and what elements of the process we are most effective in

and can identify areas where innovation and productivity can be leveraged to provide improved outcomes for Australian firms.

2. *How can Queensland make best use of its natural resources in creating jobs for Queenslanders?*

Additional Value Adding to Raw Materials

One of the obvious ways of making better use of our natural resources is to undertake more of the subsequent manufacturing steps in Australia and not to export raw materials and input products which have been processed offshore. While considering the required balance of trade and maximizing the potential value of Australian natural resources, opportunities for adding value should be sought. For example this can apply to the minerals, timber and petroleum industries where a condition of granting access to these resources could require a percentage of the returns (profit or taxes) to be invested into plant and equipment to undertake more of the processing locally over time. This would have tremendous value, particularly for regional centres if such investment was located in proximity to the source of the raw materials. It is suggested that the Cooperative Research Centres (CRCs) could be engaged to identify and prioritise areas for maximum benefit.

Further investment in Innovation and Productivity Improvement

Given the significant natural resources we have there is great opportunity for Australia and Queensland in particular to provide world leadership on innovation into new ways of utilizing these resources more effectively. For example coal to liquid or gas to liquid processing, geothermal power generation, and improved health and safely techniques in mining are all areas in which investment and control of Intellectual Property would position Queensland well on the world stage.

Take Full Advantage of our Global Position

Queensland is uniquely positioned on the globe and full advantage should be taken of the position we have. We are in a stable, secure political environment. We have a mild climate without extremes of heat or cold. We have land located close to the equator which can support aerospace projects with a payload advantage for any space launches. We have vast areas of open land with excellent sunlight hours for solar projects. We have some of the world's best research organizations. It is because of these that we should be looking to promote the advantages of these resources for global projects where these collectively position Queensland as a forerunner for these major projects.

Further Investment in Relevant Infrastructure

At present there is significant investment in infrastructure projects. This should be continued with a focus on emerging industries and the removal of bottlenecks in existing industries. For example, for Queensland to be a powerhouse on a world scale requires world standard ports, rail and transport infrastructure and contemporary construction capability such as Pre-Assembled Modules (PAMS). Either direct Government investment or encouraging corporate investment in these areas will yield more competitive manufacturing and resource sectors and position Queensland to grow these industries and subsequently the jobs within them.

3. *Is Queensland's science, research and technology infrastructure effectively utilised? Can it be used more effectively to enable greater employment in these fields?*

No comment made

4. *How can Queensland promote innovation in Queensland industry to create employment opportunities? How do we create jobs from public and private investment in research and development?*

Innovation is a term which is poorly understood. As noted in the recent National innovation System Review[2], the term innovation is "much more than the transmission of knowledge down the pipeline of production from research to development to application … Innovation in the first decades of the 21st century is more open and pervasive, characterised by skill in collaborating and making connections so that knowledge flows and grows, and so becomes available to meet customer and community needs." It is within this context that this response focuses to provide a framework to ensure employment opportunities can be gained from the significant public and private R&D investment being undertaken in Queensland.

As noted in the in Economic Development Committee Issues paper No.1 (July 2009), the Queensland Government has been encouraging diversification from Queensland's traditional economic areas, including emerging and knowledge based industries. QMI Solutions, together with its university and private firm stakeholders has established strong links into a number of these sectors and is well positioned to promote the value of a broader understanding of innovation to the wider community. It has already begun to strategically link its key stakeholders (including SME's, university researchers and their industry partners) around major industry initiatives and forums.

By facilitating such connections, the SME community in particular, will have a wider exposure to major public and private R&D activities, with the benefits being twofold. Firstly, it allows the SME community, who are often closely aligned to customer and market needs to provide input into the direction of sector based R&D activity. Secondly, SME involvement at an initial stage of R&D activity should result in earlier adoption and utilisation of R&D outcomes as paths to markets are identified sooner.

This form of engagement builds upon the Enterprise Connects Research in Business scheme[3], which aims to: help break down the cultural divide between business and the research sector; speed the dissemination of expertise; accelerate the adoption of new ideas and technologies and; increase competitiveness of firms. However it does so with a more strategic focus around key industry sectors focusing on major R&D projects which are being led by public and private organisations. It is suggested that to better support this activity, SME's must become more entrepreneurial in their approach to identify and develop opportunities which are presented from larger R&D activities. This cultural organisational transformation needs to be part of a wider educational program to the SME community, which would focus on strategies to enable them to engage with large R&D programs.

[2] http://www.innovation.gov.au/innovationreview/Documents/NIS_review_Web3.pdf

[3] http://www.innovation.gov.au/innovationreview/Documents/NIS_review_Web3.pdf

Through such a program, the SME community would be better informed to engage in R&D collaborations, which would result in greater employment opportunities from these firms.

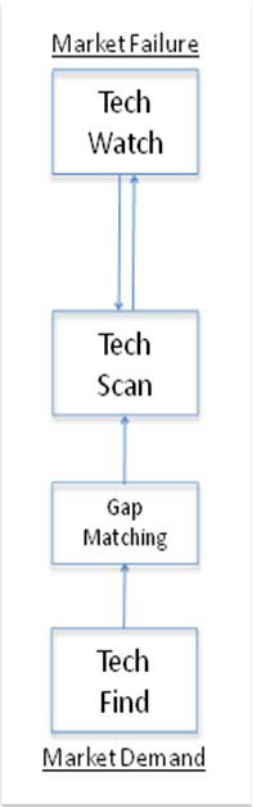
5. *How should Queensland identify new and emerging industries and support the creation of employment in new industries?*

The identification of new and emerging industries is the front-end and initiator of technology diffusion activities, for which QMI Solutions is the pre-eminent organisation for manufacturing and related industries in Queensland, a position it has held for the last 16 years.

Technology Scanning is a fundamental activity in this front end and is the generic term for the multi-level activities which allow new technologies to be located and assessed and their impact on traditional industries determined. This technology scanning activity has three levels:

Tech Watch

Tech Watch is generally industry or major sector wide. It is driven by technology push and broad drivers such as Government policy, emerging technologies and market and industry trends. The findings of a Tech Watch are likely to have broad industry strategic implications and may be used to set state or national priorities. It may be presented in the form of a technology or industry roadmap or other report that may be diffused directly to Government, industry bodies and universities and broader industry through education and awareness programs such as Enterprise Connect Workshops and Seminars. Tech Watch is likely to be high market failure and does not necessarily identify specific technologies diffusion candidates. Where specific technologies are identified, Tech Watch may feed the Tech Scan process.



Tech Scan

Tech Scan is generally sector, subsector or multi-enterprise specific. It is driven by a common need. As such, industry and market trends, R&D and benchmarking activity act as direct drivers the Tech Scan. Technologies identified may be in market demand or market failure and as such will have variable requirements for Government assistance.

Tech Scan may be fed by information gathered from broadly focused Tech Watch activities where specific technologies are identified. It may also be driven by Tech Find activities where Gap Matching processes identify areas or common need among multiple enterprises.

In cases of Tech Scan where specific technology solutions are not identified, this may drive the target of future Tech Watch activities or drive Research and Development activities.

Tech Find

Tech Find is generally initiated by specific individual enterprise needs and as such tends to be highly specific. Gap identifying activities such as enterprise benchmarking, VOC, business reviews including technology and knowledge questionnaires and other company requests drive Tech Find activities. Where individual companies end up acquiring technologies, their potential for broader sectoral application makes them candidates for factory tours hosting, or equipment register access. Through more specific Gap Matching activities, technologies that have broader sectoral application may feed

the Tech Scan process and result in other collaborative or syndicate purchases or leasing and centralised technology housing arrangements. However, as Tech Find is driven by individual enterprise specific needs, technology solutions identified may be considered of competitive advantage to that individual company and as such managing conflict of interest and commercially sensitivities is a consideration.

The pull nature of Tech Find is likely to result in market demand and acquisition the company themselves. However, in the current economic climate, government assistance is still most likely to be required.

The combination of these activities provides an overarching activity which identifies new technology opportunities, which in themselves drive the evolution of existing industries or seed emerging industries. An example of a technology scanning activity which transferred into an entirely new industry is the acquisition of rapid prototyping technology by Queensland through QMI Solutions. The identification of this technology and its subsequent deployment and diffusion into Queensland industry created a market pull for this technology which resulted in the establishment of a number of RP bureau services, previously non-existent in the State.

We should also consider the importance of appropriate skills development in the acquisition of new technologies. Without a complementary skills and knowledge set within industry a new technology will not produce the competitive advantage it seeks and drive the wider industry development. The alignment between technology diffusion and skills development should be a closely coupled continuum, where early awareness of new and emerging technologies informs the skills agenda, and knowledge of the skilling issues within the state can inform the technology scanning program in mitigating against skills shortages. The embedding of Manufacturing Skills Queensland (MSQ) as an operating division of QMI Solutions provides an ideal mechanism to ensure that skilling strategies are in place which will transform an emerging technology into an emerging industry.

6. *How does Queensland ensure that Queensland industry is competitive in an increasingly global economy?*

In framing this response, it should be noted that these comments are pertinent to the manufacturing sector, but that the manufacturing sector itself is the largest provider of full time jobs in the state[4]. Queensland's manufacturing sector is decentralised, with approximately 30% of manufacturing industry located in rural areas and comprises approximately 98% SMEs. These combine to produce an agile, flexible and responsive industry able to respond quickly to international issues, essential if the enterprises are to engage with and be competitive in a global economy. It should also be noted that a strong manufacturing sector is a prerequisite for the continuing prosperity of other key industry sectors such as mining and resources, construction and primary industry, particularly true for rural and regional Queensland.

To support this level of engagement and agility there are a number of underlying enablers that must be addressed through government support programmes and interventions.

Global engagement is achieved through international competitiveness, and this is realised by companies adopting leading edge and world's best practice in all aspects of their business. Through its support of QMI Solutions, Queensland government has for many years given Queensland

[4] *Advanced Manufacturing Sector Action Plan, Queensland Government, Aug 07*

companies exposure and access to world's best practices and new technologies such as stereolithography, lean manufacturing and new product development.

The adoption of such best practices is a staged process and requires a continuous approach to:

- knowledge acquisition
- technology investment
- skilling development
- skills training

For the majority of individual enterprises, these stages remain beyond them as the business owners and decision makers are primarily involved with working in the business, rather than on it. At an industry level Queensland SMEs historically work in an isolated and fragmented manner leading to a lack of coordinated response.

In these cases the stages above are not enabling steps but barriers to competitiveness. Access to centralised and subsidised programs such as those delivered by QMI Solutions results in support being available to assist companies to move through the stages above.

Knowledge of new technologies and techniques is collated and evaluated at both industry sector and enterprise level by QMI Solutions and the information communicated to the industry through a number of channels including websites, magazines, seminars, workshops and demonstrations, throughout the state. These new technologies can also be sought out, given a specific industry issue such as CO_2 reduction, or investigated for a specific sector such as food processing or the marine industry. (Please refer to Issue 5 and the discussion of Technology Scan: Technology Scan: Technology Find). Through its position in the Queensland manufacturing landscape, QMI Solutions also informs government and other stakeholders on new technology opportunities and knowledge gaps. As the Centre of Excellence for manufacturing within the state, organisations know that QMI Solutions and its network of third party providers, and partners can provide knowledge on a wide range of topics.

Technology investment decision support is provided from a position of commercial neutrality and for key manufacturing system investments such as ERP system selection, coaching is provided to the company on vendor discussions and trials, increasing confidence that an optimised solution will be found.

In both of these stages, the status of QMI Solutions as a 'not-for-profit' organisation engenders trust in client companies and research undertaken by QUT has shown that the status of QMI Solutions as a trusted intermediary is a position that must not be compromised.

"Contact with technology diffusion agencies (TDAs) such as QMI Solutions was found to be related to greater levels of innovation adoption, particularly for those organisations that did not have a high level of innovation culture. Furthermore, this contact was also related to higher levels of subjective norms (beliefs that valued external agencies think that innovation is important) and higher levels of technical readiness.[5]"

5 External Agencies & Organisational Innovation, Dr K Unsworth, Feb 2008

Skilling development must be phased with new technology acquisition, both at an enterprise level and at an industry level. Through Manufacturing Skills Queensland skilling strategies are developed which will ensure that maximum leverage is gained from the adoption of new technologies.

Skills training at an enterprise level ensures that maximum competitive advantage is gained through the use of new processes and systems and that the workforce remains motivated and engaged in the business. Loyal and motivated staff also create a continuous improvement culture leading to higher levels of competitiveness through innovation.

It should also be noted that participation in programs such as those provided by QMI Solutions can lead to fundamental changes in the attitudes and actions of companies in engaging with external organisations and new technologies or practices. The acquisition and evolution of these dynamic capabilities leads to greater enterprise innovation, leading to greater competitiveness and even greater levels of knowledge seeking and exposure.

"Third party intermediaries play a fundamental role in this process. They provide, through their programs, the trigger for individual firms to commence or progress the process of enhancing their capabilities. This may be through access to new networks (especially learning networks rather than transaction networks), directly through the content of the program and its impact on the operational management of the firm, through increasing the motivation to gather new external knowledge, improved internal communication processes, and increased ability to exploit opportunities. This may not happen immediately as capabilities are built over time. This also means that programs which are extended over a long period, are periodical, or where there is ongoing support for the participant beyond the program, align well with this developmental process.[6]"

Both of these research studies provide formal evidence and conclusion on the importance of "knowledge intermediaries" and this reinforces the experience and anecdotal evidence gathered by QMI Solutions.

This type of fundamental organisation change must however be measured and contextualised, particularly as a company moves into a more global environment. The benchmarking program supported by Queensland government since 2004 provides both a means to measure an individual company's improvements over time, and also an international comparison. A recent analysis of companies who had undertaken multiple benchmarks over time showed that improvements are made in either the practices they employ, or the results they achieve or both, year on year. The original benchmarking program is constantly developing and now includes specific activities for organisational effectiveness, sustainability and innovation, reflecting current trends and themes in the international manufacturing environment.

The final piece in the global jigsaw is the ability of Queensland companies to participate in global supply chains and projects, given the size and scale issues associated with not just Queensland, but Australian companies. In managing supply chain initiatives, world's best practice would suggest the use of a formal model such as the Supply Chain Council's SCOR model. In reality, this is cumbersome and onerous for the majority of Queensland SMEs to implement without support, due to the fundamental demographic differences between European / US SMEs and their counterparts in Australia. This is a classic example of market failure – an internationally recognised tool which is not fully adopted in Queensland due to structural differences in the industries. QMI Solutions acts as an

6 The Queensland Knowledge Transfer System Project Report, Prof R Parker, Dr D Hine, June 2009

intermediary in this instance by understanding and modifying the basic SCOR model to make it more relevant for local companies and by assisting in its implementation and customisation.

Through their support of QMI Solutions Queensland government has established a position of national leadership and many aspects of the Queensland system have been used as a model for the federal governments Enterprise Connect (EC) program, a fact acknowledged by Senator Kim Carr at the opening of the Queensland EC Centre in September 2008.

To remain relevant to Queensland manufacturing and to continue to increase the ability of Queensland industry to compete on an international scale, QMI Solutions must continue to identify, disseminate and embed new technologies and practices into individual enterprises. New challenges include making manufacturing industry more sustainable, giving companies a technological edge with which to compete against international manufacturers with lower cost labour, and continuing to meet the need to reduce manufacturing costs. QMI Solutions continues to strengthen its partnerships with international organisations such as the Manufacturing Advisory Service in the UK and the Manufacturing Extension Program in the US to exchange ideas and to ensure that it is itself exposed to and engaging in worlds best practice programs in its own "industry". Through the third party program, QMI Solutions also offers specialist services to individual companies and this program permits our own response to be dynamic, flexible and highly responsive to the needs and challenges of Queensland industry.

7. *What are Queensland's comparative advantages and how should Queensland make best use of these advantages?*

Professor Michael Porter in *The Competitive Advantage of Nations* argues that "competitiveness is not merely greater efficiency based on working harder or even working smarter. It is not merely doing things better but doing better things. It requires firms with the know-how to capture greater value in the market place not just by being more efficient at what they do, but also in *choosing where to compete*"…. in other words, to focus on competitive advantage. Consequently, this response deals with competitive advantages rather than comparative advantages.

Competitive advantage can be derived through three main drivers, individually or in combination, as follows:

- Superior resources (natural and/or intellectual)
- Local challenges that drive innovative solutions
- Proximity to long term markets.

Queensland possesses a number of clear areas of competitive advantage including mining (particularly coal mining), beef, sugar and the tropics based on the State's natural endowments and it has strongly developed industries in these areas. It is also possible to base competitive advantage on intellectual resources and skills or where the State may face unique challenges.

For example, in its response to the water crisis, Queensland has developed a level of expertise that provides a competitive advantage. In seeking solutions to problems such as these, Queensland can effectively invite investors to participate in developing innovations and solutions that they can then apply to similar problems in their own markets. The United States for instance has a major water infrastructure gap with an estimated need for a US$277 billion investment over a 20 year period.

Queensland should seek to identify and exploit these new areas of competitive advantage, rather than rely on the traditional areas of natural endowment. Areas such as our response to the urban population growth in south east QLD, our response to the development of a LNG industry in QLD and our response to the opportunities that the $17bn infrastructure program may provide in terms of competitive advantage.

8. *How can Queensland's industry promotion strategies best support QLD industry to be competitive in the global marketplace?*

Industry promotion strategies that may assist QLD industry to be more competitive in the global market place include:

Skilling Strategies
Assisting development of a skilled workforce through:

- sector-specific skills formation strategies
- industry/school partnerships
- career education and promotion.

Innovation Strategies

- international benchmarking and diagnostic services
- technology diffusion programs, such as QMI Solutions
- partnerships between industry and research and technology agencies whole-of-business innovation support combining people, practices and products

- product and process development based on sustainability principles.

Productivity and New Capability Strategies

- further investment in programs such as QMI Solutions
- facilitation of market and project-focused supply chains
- delivery of mentoring and capital-raising support
- targeted investment attraction
- more focus on Local Industry Policy
- regional industry networks and partnerships.

Linkage strategies between the R&D sector and SMEs

- Facilitating researchers to assist business
- R&D SME Forums
- Embedding industry professional in R&D organisations
- More effective engagement between industry and CRCs

9. *Should industry promotion strategies be narrowly focused on a small number of particular industries or be more broadly based?*

The current Smart Industry Policy identifies 15 key strategic priority industry sectors located throughout Queensland. These industries are:

- Advanced manufacturing

- Alternative fuels
- Aviation
- Biotechnology
- Creative industries
- Environmental and mining technologies and services
- Information and communication technology
- Marine industries
- Mining
- Primary industries
- Processed foods
- Therapeutic medicines and devices
- Tourism
- Water
- Wine

However, these industries are broad in nature. Consideration should be given to refining these into focus areas where Queensland has a specific competitive advantage. Effective industry promotion strategies will based on where Queensland has a competitive advantage. For example, in the aviation industry, Queensland has little presence in aircraft design and manufacture, but has strengths in maintenance and assembly.

There is much useful information in the government's current industry action plans, but consideration needs to be given to ensuring they have more focus based on QLD's competitive strength's. More specific information is also needed in terms of how the plans are to be implemented and also overall vision and targets for each sector.

10. *What can the Queensland Government do to improve employment opportunities for groups such as youth, mature age, Indigenous and disadvantaged workers?*

Expand Manufacturing and Engineering Gateway Schools Model

The Gateway Schools to the Manufacturing and Engineering Industry (MEGS) Project managed by Manufacturing Skills Queensland is a key initiative of the Department of Education and Training. This project is significant in meeting the Queensland Government's aim of transitioning young people from school to work by providing a 'gateway' for students to take up careers in manufacturing and engineering. The initiative also provides a 'gateway' for Queensland enterprises to their future workforce, including school-based apprenticeships and traineeships and full-time apprentices and trainees. MSQ propose that the MEGS model be expanded as the project currently only involves 24 Queensland secondary schools engaging collaboratively with their respective local manufacturing and engineering enterprise, registered training organisations, universities and other groups to:

- raise the profile of careers in manufacturing and engineering;
- provide professional development for teachers in the context of manufacturing and engineering;
- develop and implement a range of manufacturing and engineering related activities across key learning curriculum areas;

- create opportunities for work experience, structured work placement, school-based apprenticeships and traineeships, full-time apprenticeships and pathways to university in preparation for trade, para-professional and professional careers; and
- celebrate and share student, teachers, school, parent and industry experiences to ensure young people have the knowledge and experience to make informed decisions about their future.

This model is seen as an excellent vehicle to improve apprenticeship take up and involvement by employers with their future labour force. For example, an industry recruitment strategy has been developed through the MEGS Project in order to identify education and training pathways for students to take up careers in manufacturing and engineering, specifically school-based apprentice and traineeships. This model has been developed to attract young people to the manufacturing and engineering industry and ensure that they are eligible to engage in both Vocational Education and Training (VET) and tertiary pathways.

Increase 'Employability Skills Training' to increase employer take up of Apprenticeships

Make additional funding available for specific skills set training to cover induction training for people entering the workforce. This program will give the basic skills to start work in the prior to commencing a traineeship. The skills set will include core units from a certificate II level (i.e. WH&S, communication in the workplace, etc); giving people the basic start for the certificate before sign up.

Strategies to improve take up of full time apprenticeships by apprentice and/or employer

Take up of Apprenticeships can be encouraged by more defined career pathways being offered to potential & existing apprentices to make sure industry has higher qualified tradespeople available to expand industries in the future. In that respect, a focused strategy on educating careers advisors in schools, job networks, etc on the 'benefits' and career pathways by taking up an apprenticeship would improve take up rates, but more importantly, the quality of candidates seeking a new apprenticeship.

Lobby the Commonwealth Government to relax the '7 year requirement' for existing workers who have previously received commonwealth incentives. This will increase the take up of apprenticeships – particularly at higher levels – skill the existing workforce and create more opportunities for entry level training within enterprises.

Food Sector Specific opportunities for youth, mature age, Indigenous and disadvantaged workers

Provide core skills set training for the food industry as a prevocational program to provide greater opportunities for people to enter into the food industry. Within the food industry, Food Processing, Meat, and Pharmaceutical/Nutraceutical sectors induction training is required prior to commencing work and in many cases carried out as a compliance issue. This training must be carried out for all employers including casual staff. The training must cover the basics of safe handling of food products. The subject matter is also covered in the core units for Food Processing, FDF03 and Australian Meat Industry, MTM07. An employee entering the food industry would not be exposed to this training unless they were completing a traineeship or apprenticeship. As a casual worker is not eligible for a traineeship or apprenticeship they cannot complete training in any of the core units. If the core units were conducted as pre-vocational training (Skills Set) and funding was made available, the employer could place the employee straight into the work force. This would greatly reduce the time taken for

induction training. Casual workers could also receive the same training as full time and part time employees, standardising the training process.

11. *Should full-time employment be a priority in creating employment opportunity? How should Queensland respond to underemployment?*

While the best outcome would be full-time employment, the priority should be on an employment opportunity/outcome of any kind in this current economic climate, i.e., casual, part-time or full-time. A priority on full-time employment will only create fewer opportunities for the unemployed to gain employment in some form and thereby increase unemployment levels. An employment outcome at any level will stimulate consumer confidence, reduce unemployment levels and in turn inject revenue into the state economy.

The Queensland government should respond to underemployment in a positive manner in the context as stated above. Funded training programs should be targeted in skill sets for existing 'underemployed' workers which will have a twofold effect – increase the capabilities of the existing workforce and place the workforce in the best position to respond to skilling needs when the economy turns. One possible avenue for providing funding of this kind would be to extend the current Productivity Places Program to include funding in specific skill sets which align to a full qualification.

12. *Should the government target policies at certain regions in Queensland? What criteria should be used to select these regions?*

No comment made

13. *Do the current Queensland Government employment programs help develop individuals with the skills that employers need?*

The current Queensland Government employment programs under the 'Skilling Queenslanders for Work Initiative' such Get Set for Work, Productivity Places and Experience Pays do help to develop the skills of individuals sought by employers, but more is required (refer to issue 15).

14. *What role do employers have in developing and enhancing the skills of their employees?*

Employers play a critical role in developing and enhancing the skills of their employees. Unfortunately, many employers still perceive that the educational institution, such as a TAFE Institute or private RTO is responsible for the training of their staff in both the theoretical and practical components. It is the employer's responsibility to ensure that they have the appropriately trained staff to meet their business and productivity requirements. Targeted educational programs could be provided to employers to better understand their role in developing a skilled workforce.

15. *Are these government programs working? If not, how can the government improve these programs or better achieve these outcomes?*

To some degree they do, but more is required. The manufacturing industry is investing in technology and this is requiring new skills to support increased use of machinery and automated equipment, increased digital design and manufacturing as well as skills in advanced digital platforms in some sectors such as aviation and electronics.

To respond to this shift in industry investment, it is important for the government to invest in the provision of skills to existing workers in these areas, embed technology skills in training for new

entrants, as well as developing skills in machinery support services to maintain this ongoing investment. Innovation in skills development, flexibility and increased front end training will play a key role in the next five years. Organisations that are able to respond to changing skill needs and implementing lean manufacturing principles within the workplace will be more successful in the future and have more sustainable businesses.

16. *What other strategies have been used successfully by other governments? Is it possible for an Australian state government to implement similar strategies to stimulate employment?*

The Queensland Government *Create it, Make it, Live it* campaign.

The manufacturing industry benefited from the successful Create it, Make it, Live it campaign as this strategy focused on raising the awareness and profile of manufacturing and engineering industry careers. The Create it, Make it, Live it campaign showed that the campaign had a positive impact on parents and school students by improving their understanding of the industry and generating increased interest in manufacturing and engineering industry careers. Funding for this program under the government's Advanced Manufacturing Plan has ceased. It is proposed that funding of this important initiative continue.

The Victorian Government Workforce Participation Programs.

Returning to Earning: $13.2 million package of grants allocated over four years to support parents returning to the workforce. These grants help meet the costs of retraining, books and materials, course fees, transport and childcare.

Experience Counts: Experience Counts aims to deliver effective and innovative strategies that result in the re-engagement of mature age workers in the workforce. Generally, the value of assistance available through Experience Counts program is up to a maximum of $5000 per mature age person returning to work.

This funding can be used to provide:

- re-orientation to an industry or occupation
- updating knowledge and skills
- further skills development and training
- personal support to mature age workers
- set up of job sharing or other flexible work arrangements
- "train-the-trainer" and supervisor courses to allow skill transfer from mature age to other workers
- mentor training
- recognition of prior learning

South Australian Parents Return to Work Program

Parents Return to Work program is an initiative (now ceased) of the South Australian Government's Population Policy 'Prosperity through People' - and is designed to assist parents update their skills for re-entry into the paid workforce. It gives eligible parents a $1200 Training Credit to be used for Training to become job ready.

Similar programs have been operational in other jurisdictions in the past with high levels of success.

17. *What other best practice approaches can an Australian state government use to stimulate employment?*

Economic stimulus via government rebate schemes is a good way to stimulate employment. For example, the current rebate schemes for home insulation and solar hot water systems are doing well in stimulating not only employment, but also consumer confidence. With regard to the home insulation rebate; this is creating employment opportunities across a broad range of industry sectors such as manufacturing, construction, administration, retail, sales & marketing, transport & distribution. By creating these employment opportunities, it is increasing consumer confidence and therefore injecting revenue back into the economy and creating more employment opportunities. A strong focus should be on considering further rebate schemes which will stimulate employment opportunities/outcomes across different industry sectors.

18. What skills do you believe are required currently in the Queensland economy?

Although the economy has slowed and unemployment has increased, 1 in 5 employers are still finding it difficult to find skilled workers. The following table highlights the most recently identified occupations as skill shortage in Queensland by Department of Education, Employment and Workplace Relations as part of their Skills in Demand List.

ASCO	ANZSCO	Occupation	Date assessed in Qld	Comment
Managers				
122111		Engineering Manager	Jun-08	**QLD:** Shortages are most evident for civil and structural engineering managers.
122211		Production Manager (Manufacturing)	May-08	
Professionals				
212511		Electrical Engineer	Mar-08	
212513		Electronics Engineer	Mar-07	
212611		Mechanical Engineer	Mar-08	
212613		Production or Plant Engineer	Jun-08	**QLD:** Shortages are particularly evident in regional locations.
212917		Chemical Engineer	Mar-07	**QLD:** Shortages are most evident for chemical engineers with substantial experience.
Associate Professionals				
312311, 312313		Electrical Engineering Associates	Mar-08	
312411, 312413		Electronic Engineering Associates	Apr-08	**QLD:** Shortages are particularly evident for control system specialists.
312511, 312513		Mechanical Engineering Associates	Mar-08	
Tradespersons				
	323211	Fitter (General)	Aug-08	
	323212	Fitter and Turner	Aug-08	
	323213	Fitter-Welder	Aug-08	
411213	323214	Metal Machinist (First Class)	Nov-08	**QLD:** Machinists with general manual machining abilities were especially difficult

				to recruit.
411411	323111	Aircraft Maintenance Engineer (Mechanical)	Nov-08	
411416	323113	Aircraft Maintenance Engineer (Avionics)	Nov-08	
411515	323313	Locksmith	Oct-08	**QLD:** In particular, emergency response locksmiths are in shortage.
412211	322311	Metal Fabricator	Sep-08	
412215	322313	Welder (First Class)	Sep-08	
412411	322211	Sheetmetal Worker (First Class) (ANZSCO - Sheetmetal Trades Worker)	Sep-08	
431111	341111	General Electrician	Jul-08	**QLD:** The shortage is particularly for mid-senior level electricians.
431211	342111	Refrigeration and Airconditioning Mechanic	Aug-08	
451211	351111	Baker	Sep-07	
451213	351112	Pastrycook	Sep-07	
492211	394111	Cabinetmaker	Dec-08	
498113	399111	Boat Builder and Repairer	Nov-08	
	399112	Shipwright	Nov-08	
498211	333111	Flat Glass Tradesperson (ANZSCO - Glazier)	Dec-08	

The additional table provided below highlights the main manufacturing and engineering areas of shortage and suggested strategies as identified by Manufacturing Skills Queensland for the manufacturing sector. Regions are identified by Queensland Department of Education and Training – Training Queensland Region.

Region	Manufacturing Sector	Skills Shortages	Action Required
Brisbane South and Gold Coast	• Engineering. • Automotive manufacturing. • Fibre composites. • Plastics. • Chemicals. • Building materials. • Machinery and equipment. • Light metals. • Electronics equipment. • Food processing. • Pharmaceuticals. • Laboratory technicians.	• Engineering tradespeople. • Up skilling of tradespeople in specialist skills. • Chemicals – site specific training demand but a need for generic/portable skills. • Building products – organisation specific training. Increase the qualifications profile of industry. • Entry level workers – light metals, engineering. • Electronics tradespeople and apprentices. • Entry level staff for food processing. • Retention of experienced staff in food processing. • Tool makers. • Competitive and sustainable manufacturing skills. • Plastics – demand for operators and technicians. Need for RPL and gap training to build the qualifications profile in plastics. • Fibre composites technicians. • Certificate training for pharmaceuticals to meet regulatory requirements. • Laboratory technicians.	• Continued investment in engineering training. • Food industry training. • Electronics industry training. • Training in specialised areas such as fibre composites, plastics and toolmaking. • Skill upgrades for tradespeople. • Entry level training. • Pharmaceuticals – certificate level training. • Competitive manufacturing qualifications. Skills sets in lean and sustainable manufacturing.
Brisbane North	• Engineering. • Automotive manufacturing. • Aviation. • Machinery and equipment. • Electronics equipment. • Fibre composites. • Plastics. • Chemicals. • Building materials. • Food processing. • Pharmaceuticals. • Laboratory technicians.	• Chemicals – site specific training demand. • Building products – organisation specific training. Increase the qualifications profile of industry. • Entry level workers – light metals, engineering. • Electronics tradespeople and apprentices. • Entry level staff for food processing. • Training and retention of experienced staff in food processing. • Tool makers. • Competitive and sustainable manufacturing skills. • Aviation maintenance engineers. • Plastics – demand for operators and technicians. Need for RPL and gap training to build the qualifications profile in plastics. • Fibre composites technicians. • Certificate training for pharmaceuticals to meet regulatory requirements.	• Continued investment in engineering training. • Food industry training. • Electronics industry training. • Training is specialised areas such as fibre composites, plastics and toolmaking. • Skill upgrades for tradespeople. • Entry level training. • Pharmaceuticals – certificate level training. • Training for laboratory technicians. • Competitive manufacturing qualifications. Skills sets in lean and sustainable manufacturing.

Region	Manufacturing Sector	Skills Shortages	Action Required
		• Laboratory technicians.	
Wide Bay and Sunshine Coast	• Engineering. • Automotive manufacturing. • Aviation. • Machinery and equipment. • Electronics equipment. • Food processing.	• Engineering apprentices. • Engineering tradespeople with high level skills. • Food technologist skills. • Entry level staff for food processing. • Trades qualified staff for the marine industry. • Entry level and experienced electronics workers. • Competitive and sustainable manufacturing skills. • Fibre composites workers and technicians.	• Expand engineering training in the Wide Bay Burnett region. • Increased training and skills development for food technologists. • Entry level training programs for food technology. • Technology training for engineering tradespeople and semi skilled workers. • Competitive manufacturing qualifications. Skills sets in lean and sustainable manufacturing.
South West Queensland	• Engineering. • Food processing. • Aviation. • Process Manufacturing	• Aviation maintenance engineers – apprentices and qualified tradespeople – covering avionics, structures, mechanical. • Technology skills for digital platforms – new defense aircraft. • Entry level staff for food processing. • Competitive and sustainable manufacturing skills. • Demand for laboratory technicians when the Surat Basin comes on stream. • Process workers for the Coal Seam Gas/LNG sector when Surat Basin comes on stream	• Expand aerospace training (high school and RTO capacity) to service the defense hub that will expand in Amberley. • Industry targeted, responsive training to support food processing in the region. • Continued investment in engineering training, fibre composites and toolmaking. • Training for laboratory technicians. • Process Manufacturing training at Certificate III level. • Competitive manufacturing qualifications. Skills sets in lean and sustainable manufacturing.
Central Queensland	• Engineering. • Machinery and equipment. • Electronics. • Chemicals. • Food processing. • Laboratory technicians. • Process Manufacturing	• Engineering apprentices. • Engineering trade skills. • High level and advanced trade skills. • Entry level staff for food processing. • Chemicals – site specific training demand but a need for generic/portable skills. • Electronics apprentices and qualified staff. • Technology skills for engineering staff – operation of automated equipment. • Competitive and sustainable manufacturing skills. • Fibre composites workers and technicians. • Laboratory technicians – shortage of technician staff in the mining industry.	• Expand engineering and process manufacturing training in the Central Queensland region to cater for LNG growth in Gladstone area. • High level and advanced trade training. • Training for laboratory technicians. • Competitive manufacturing qualifications. Skills sets in lean and sustainable manufacturing.

Region	Manufacturing Sector	Skills Shortages	Action Required
North Queensland	• Engineering. • Aviation. • Electronics. • Food processing.	• Engineering apprentices and tradespeople. • Electronics apprentices and tradespeople. • Aircraft maintenance engineers – avionics, structures and mechanical. • Competitive and sustainable manufacturing skills. • Food processing workers	• Significant increase in training numbers required to meet increased aviation and aerospace demand. • Continued investment in engineering training. • Training in entry level food processing qualifications • Competitive manufacturing qualifications. Skills sets in lean and sustainable manufacturing.

19. *How should Queensland ensure we have the skilled workers required by industry during a period of economic upturn?*

Due to the reduction in apprenticeship commencements it is proposed that further investment is made in programs which will provide pre-vocational or pre-employment training aligned to job opportunities in trade areas so individuals are provided with the necessary skills to be attractive to employers to be employed under a formal apprenticeship program.

Opportunities could also be made for increased (and subsidised) training opportunities for existing workers to update and increase their skills through the provision of training in advanced trade programs or skills sets including (but not limited to):

- Competitive Manufacturing and Sustainable Manufacturing
- Specialist welding training (particularly to cater for the Coal Methane Gas and LNG projects in Surat Basin and Gladstone)
- Advanced hydraulics and pneumatics training.
- Specific training programs to support commonly used automated machines and robotics in the engineering manufacturing sector.
- Up skilling and short training programs on 3D modelling, direct digital manufacturing and related skills.

A focus could also be on programs that can be utilised by the school sector to ensure investment continues into tomorrow's manufacturing workforce such as pathways for school students under Diploma in Engineering Advanced Trade and Diploma of Engineering Technical in year 10/11, following on from Certificate I and II in Manufacturing years 8-10 (refer to Appendix 1 for model). Additionally, provide Diploma in Lab Operations and Diploma in Avionics qualifications in year 11 and 12 similar to the proposed pathway for Diploma in Engineering.

20. *Is there a role for the development of generic skills that can be used across a number of industries and occupations instead of training for a particular job or occupation? Is there a need for both types of training?*

Yes, there is a role for development of generic skills that can be utilized across different industries and sub sectors. For example, within the food sector it would be beneficial to provide core skills set training for the food industry as a prevocational program to provide greater opportunities for people to enter into the food industry. Within the Food Processing, Meat, and Pharmaceutical/Nutraceutical sectors induction training is required prior to commencing work and in many cases needs to be carried out as a compliance issue. The training must be carried out for all employers including casual staff and must cover the basics of safe handling of food products. An individual entering the food industry would not be exposed to this training unless they were completing a traineeship or apprenticeship. However, as the majority of individuals commence work in the food sector under casual employment arrangement they are not eligible to undertake a traineeship or apprenticeship and cannot complete training in any of the core units. An opportunity to address this issue would occur if funding was made available for the delivery of the core units (skills set) as part of a pre-vocational training program accessible for all individuals entering employment, whether casual, part-time or full-time in the food processing industry.

21. *What impact does regulation have on the creation of employment opportunities in Queensland? How will the proposed regulatory reforms help stimulate employment opportunities?*

No comment made

22. *How could Queensland reduce the cost of regulation on Queensland employers?*

No comment made

23. *How can Queensland be made an attractive destination for business investment?*

No comment made

Appendix 1 - Diploma of Engineering – Technical

Proposed Trial MEM50205 Diploma of Engineering – Technical for Year 11 and Year 12 Students

Objective(s): The purpose for developing a training plan for Year 11 and Year 12 students to attain competencies towards MEM50205 Diploma of Engineering – Technical is to:

- Attract young people to the manufacturing and engineering industries.
- Link the Diploma of Engineering – Technical trial to the Manufacturing Scholarship program (see Appendix 10) to engage more young people.
- Overcome the industrial relations implications of school students attaining MEM Certificate III level technical qualifications and beyond outside a school-based apprenticeship or full-time apprenticeship.
- Recognise the quality of Computer Aided Drafting (CAD) training schools are delivering.
- Utilise "Diploma" as opposed to a "Certificate" as an attraction for students and their parents to choose manufacturing and engineering as a preferred career pathway.
- Map both Vocational Education and Training (VET) and Overall Position (OP) pathways for students across four (4) semesters in Year 11 and Year 12.
- Identify an appropriate school-based apprenticeship pathway.
- Implement a training plan delivered collaboratively by schools, SkillsTech Australia and employers.
- Address future skilling needs for the manufacturing and engineering industries.

Training Plan

The training plan will include eight (8) modules that students will undertake, together with successful completion of Year 10 Graphics and Year 10 Mathematics as prerequisite subjects for entry into the program. At this stage it is proposed that Year 11 and Year 12 students will study, a combination of Mathematics B, Graphics, Engineering Technology or Technology Studies and Physics.

Target competencies – 1 QCE credit per completed competency		
MEM30007A	ET & TS	Select common engineering materials
MEM30012A	M & ET	Apply mathematical techniques in manufacturing, engineering or related situations
MEM12024A	M & ET	Perform computations
MEM12025A	M & ET	Use graphical techniques and perform simple statistical computations
MEM30001A	G	Use computer aided drafting systems to produce basic engineering drawings
MEM30002A	G	Produce base engineering graphics
MEM30003A	G	Produce engineering drawings
MEM09005B	G	Perform base engineering detail drafting
MEM30004A	G	Use CAD to create and display 3D models
MEM30005A	ET & TS M & P	Calculate force systems within simple beam structures
MEM30006A	ET & TS M & P	Calculate stresses in simple structures

Possible relevant subjects
Mathematics B (MB) – 4 QCE credits Graphics (G) – 4 QCE credits Engineering Technology (ET) – 4 QCE credits **Prerequisites** Year 10 Graphics Year 10 Mathematics

Outcomes: Trial to commence in 2010 in Mackay, Brisbane and the Gold Coast.

Eight (8) competencies identified from MEM50205 Diploma of Engineering – Technical that Year 11 and Year 12 students can undertake through a school-based apprenticeship, undertaking Graphics, Engineering Technology and Mathematics B concurrently with other key learning areas providing eligibility for both an OP score and a VET outcome.

Students participate in the Diploma program in the relevant context with Industry engagement.

Students successfully transitioning from school into work and/or further education and training.

Learning management and statements of attainment provided by SkillsTech Australia.

A successful trial developed and included as a core part of the career development model for CAD and engineering education and training programs.

Five Year 11 students from each region commence the trial program in 2010.

Five Year 11 students from each region commence the trial program in 2011.

Five Year 12 students from each region complete the trial program by December 2011.

Five Year 12 students from each region complete the trial program by December 2012.

Fifteen MEM50205 Diploma of Engineering – Technical SATs available in 2010.

Fifteen MEM50205 Diploma of Engineering – Technical SATs available in 2011.

Twenty-five employers engaged and providing mentoring, work experience and / or SATs.