ISSUES PAPER  Manufacturing in Queensland

NOVEMBER 2016
Table of Contents

INQUIRY INTO MANUFACTURING IN QUEENSLAND ............................................................ IV
Have your say ........................................................................................................ iv
Key dates ............................................................................................................... iv

THE ROLE OF THE COMMISSION ............................................................................. V

1 ABOUT THE INQUIRY ........................................................................................... 1

2 MANUFACTURING IN QUEENSLAND ................................................................. 2

3 OUTLOOK FOR MANUFACTURING IN QUEENSLAND ........................................... 8

4 DRIVERS OF MANUFACTURING GROWTH ......................................................... 12

5 GOVERNMENT POLICIES AND PROGRAMS ....................................................... 15

6 STRUCTURAL ADJUSTMENT AND THE COMMUNITY ......................................... 18

7 REGULATION ........................................................................................................ 20

APPENDIX A : TERMS OF REFERENCE .................................................................. 22

REFERENCES .......................................................................................................... 24
Inquiry into Manufacturing in Queensland

On 15 September 2016, the Treasurer asked the Commission to undertake an inquiry into Queensland's manufacturing sector, including a review of reshoring initiatives. The Commission has prepared this Issues Paper to assist you and other stakeholders to make submissions.

Have your say

The Commission encourages individuals, businesses or organisations interested in Queensland’s manufacturing sector, or the issues raised by the Inquiry, to contribute.

Make a submission

You are welcome to provide written submissions on matters raised in the Issues Paper, or other matters relevant to the terms of reference. Submissions are due by close of business 10 January 2017.

Submissions can be lodged online or via post:


Manufacturing Inquiry
Queensland Productivity Commission
PO Box 12112
George St  QLD  4003

Submissions will be treated as public documents and published on the Commission’s website. If you wish to make a submission that contains genuinely confidential information, please provide confidential material in a clearly marked separate attachment.

Key dates

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
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<tbody>
<tr>
<td>Terms of Reference</td>
<td>15 September 2016</td>
</tr>
<tr>
<td>Issues Paper released</td>
<td>November 2016</td>
</tr>
<tr>
<td>Due date for submissions</td>
<td>10 January 2017</td>
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<tr>
<td>Release of the Draft Report</td>
<td>May 2017</td>
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<tr>
<td>Further consultation</td>
<td>mid 2017</td>
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<tr>
<td>Final Report submitted to the Government</td>
<td>August 2017</td>
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Register your interest

If you wish to participate, please register your interest to ensure you receive our email alerts on key developments including release of reports, call for submissions and details of public consultation.

Contact us

Enquiries regarding this project, including making arrangements to meet with the team can be made via telephone (07) 3015 5111 or online at http://www.qpc.qld.gov.au/contact-us/
The Role of the Commission

The Queensland Productivity Commission (the Commission) provides independent advice on complex economic and regulatory issues, and proposes policy reforms. The Commission’s goal is to increase productivity, drive economic growth and improve living standards in Queensland.

Wide-ranging, open and transparent public consultation underpin the Commission’s functions.

The Commission is an independent statutory body established under the Queensland Productivity Commission Act 2015.

The Commission’s work encompasses four key streams:

- public inquiries into matters relating to productivity, economic development and industry in Queensland, as directed by the Treasurer
- research and advice on matters beyond the formal inquiry function
- advice and guidance to government departments on the quality of regulatory proposals
- investigation of competitive neutrality complaints about state and local government business activities.

The Commission operates independently from the Queensland Government—its views, findings and recommendations are based on its own analyses and judgments.

The Commission has an advisory role. This means it provides independent advice to the government that contributes to the policy development process—but any policy action will ultimately be a matter for the government.

After undertaking a public inquiry, the Commission provides a written report to the Treasurer who must provide a written response within six months. Following this, the Commission publishes the Final Report.
The changing role of the manufacturing sector, and its future prospects, has been subject to considerable debate in the last few decades. One view is that strong international competition and rising business costs will see a further shift away from manufacturing. Another view is that greater access to global supply chains and markets, natural material endowments and sophisticated service inputs provide rich opportunities.

In 2014-15, the manufacturing sector contributed over $20 billion to the Queensland economy. Outside its direct contribution, the manufacturing sector has links to:

- other domestic businesses as supplier to, and as purchaser of, goods and services
- associated services such as applied research, engineering, industrial design, process improvement, logistics and client support
- workers and communities as a key employer, particularly in some regional cities and towns
- export markets.

Within this context, the Commission has been asked to identify policy options that would improve the productivity and competitiveness of the manufacturing sector in Queensland.

Key to this will be understanding the main factors driving competitiveness for firms in the sector. Identifying barriers to Queensland firms producing advanced manufactured products, or applying advanced practices, processes, technologies and systems to their business will be important.

The inquiry will also consider the impact of structural adjustment, particularly for businesses, workers and communities less able to adapt and reposition themselves in a changing market.

The full terms of reference is provided as at Attachment A.
## Manufacturing in Queensland

### What is manufacturing?

Manufacturing can be defined as the physical or chemical transformation of materials, substances or components into new products.\(^1\)

Manufacturing is a diverse industry—over 140 of the 500 Australian Bureau of Statistics industry classes sit within the manufacturing industry as shown in Figure 1.

Manufacturing generally transforms raw materials from agriculture, forestry, fishing and mining, as well as products of other manufacturers.

### Figure 1 Types of manufacturing

<table>
<thead>
<tr>
<th>Category</th>
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<tbody>
<tr>
<td>Food products</td>
</tr>
<tr>
<td>Beverage and tobacco products</td>
</tr>
<tr>
<td>Textile, leather, clothing and footwear</td>
</tr>
<tr>
<td>Wood products</td>
</tr>
<tr>
<td>Pulp, paper and converted paper products</td>
</tr>
<tr>
<td>Printing (including the reproduction of recorded media)</td>
</tr>
<tr>
<td>Petroleum and coal products</td>
</tr>
<tr>
<td>Basic chemical and chemical products</td>
</tr>
<tr>
<td>Polymer product and rubber products</td>
</tr>
<tr>
<td>Non-metallic mineral products</td>
</tr>
<tr>
<td>Primary metal and metal products</td>
</tr>
<tr>
<td>Fabricated metal products</td>
</tr>
<tr>
<td>Transport equipment</td>
</tr>
<tr>
<td>Machinery and equipment manufacturing</td>
</tr>
<tr>
<td>Furniture</td>
</tr>
</tbody>
</table>

*Source: Australian Bureau of Statistics (Australia and New Zealand Standard Industrial Classification).*
Manufacturing is generally a sequential process, with raw materials converted into basic components, which are then combined with other components to produce more complex inputs that are ultimately made into final goods. Figure 2 illustrates the activities that typically comprise manufacturing supply chain.

Figure 2 Manufacturing supply chain

Modern production systems can be complex and rely on a comprehensive supply chain or network of multiple suppliers, vendors, service providers and buyers to produce and deliver a product to the customer.

The distinction between manufacturing and other activities, such as research, product design and services, is becoming less clear. This means that the relationships among businesses, their customers and their suppliers are also changing.

The primary focus of this inquiry is on activities undertaken at production facilities, but may also consider activities beyond this, given the interrelated nature of product development, production and supply systems. This may be particularly important when understanding innovation and how successful collaboration between different parts of the supply chain may improve outcomes.

An overview of the manufacturing sector in Queensland is provided in Figure 3.
Figure 3  Snapshot of manufacturing in Queensland

Contributed **over $20 billion** to the Queensland economy in 2014-15

7% State Output
5th largest sector

**Exports → $18.1B**
- Food and beverage
- Metal and mineral
- Machinery and equipment
- Energy and chemical
- Pulp, printing and textiles
- Other

China is largest manufacturing export destination

**$59 779**
Average annual earnings

**88%** full time

**168 800** jobs (2015-16)

6th largest industry by employment (2016)
Concentrated in south east

**16 400** businesses (June 2015)

20% of total private R&D in Queensland (2013-14)
> $500 million
Most R&D is by large firms

Note: All data is for 2014-15 unless specified otherwise.
Queensland’s manufacturing sector is characterised by diversity. It is made up of over 16,400 businesses. These are mostly small and medium sized firms (93 per cent employing 19 or less workers) but also includes large multinational organisations.3

Figure 4 Real manufacturing output ($ billion)

The manufacturing industry in Queensland has evolved to reflect Queensland’s comparative advantages: abundant land, minerals and metal ores, access to Asian markets, strong institutions and an educated workforce.

Queensland’s natural strengths mean industry outputs are largely related to food production, minerals and metals processing, and production of machinery and equipment.

Over 15 years, the Queensland manufacturing industry grew, on average, 4 per cent per year (Figure 4). After 2006-07, the sector shrunk, with real output in 2014-15 around 17 per cent lower than in 2006-07.2 This contraction coincided with the resources boom, when labour costs rose rapidly and an appreciating exchange rate made exports increasing uncompetitive. In recent years, with labour costs and exchange rate pressures easing, the sector’s real output has again started to rise.

Although a key industry in Queensland, manufacturing as a share of total real output has declined over the past 15 years, from over 10 to about 7 per cent—a trend seen nationally and internationally as depicted in Figure 5.

Figure 5 Decline in manufacturing’s share of production, 1999-00 to 2013-14 (percentage point)2,4

Sources: ABS National Accounts (Cat No. 5220.0), World Bank 2016.
**Manufacturing and employment**

Figure 6 shows that, around 168,800 people were employed in manufacturing in Queensland in 2015–16. The majority of manufacturing employment was concentrated in south east Queensland.

Figure 6 Manufacturing employment (000s)

Food and beverage product manufacturing is by far the largest employer of manufacturing workers in Queensland. These sectors grew the most over the past 15 years, adding 12,400 employees.

Manufacturing employment in Queensland is predominantly full-time (88 per cent). This has been static for a decade and is expected to remain so over the medium term.

Source: ABS Labour Force (Cat No. 6291.0.55.003)

**Manufacturing and exports**

A large proportion of manufactured products are produced for export. Queensland’s largest manufacturing export products in 2015 are shown in Figure 7.

Figure 7 Queensland manufacturing exports

High-technology\(^1\) exports account for 3.1 percent of Queensland’s manufactured exports total value in 2015, with this share remaining largely unchanged from a decade ago.\(^5\)

**Figure 8** Top 10 Export destinations ($billion)

<table>
<thead>
<tr>
<th>Country</th>
<th>2015</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>$3.2</td>
<td>$0.5</td>
</tr>
<tr>
<td>Japan</td>
<td></td>
<td></td>
</tr>
<tr>
<td>United States</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Korea, Republic of</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indonesia</td>
<td></td>
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<tr>
<td>United Kingdom</td>
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<tr>
<td>New Zealand</td>
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<tr>
<td>Papua New Guinea</td>
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<tr>
<td>India</td>
<td></td>
<td></td>
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<tr>
<td>Taiwan</td>
<td></td>
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</tbody>
</table>

*Source: Queensland Treasury 2016*

Figure 8 shows that China is now Queensland’s largest manufacturing export destination, with exports increasing from $0.5 billion to $3.2 billion over the last decade.

Other key export destinations in the last decade include Japan (although down from $2.8 billion to $2.4 billion), the United States (up from $1.2 billion to $2.3 billion) and South Korea (up from $1.1 billion to $2.1 billion).

Exports to Indonesia, India, Papua New Guinea and the United Kingdom have also risen over this period.

**Manufacturing and research and development**

A robust manufacturing sector has long been associated with high levels of innovation and productivity growth. Manufacturing can play a role in facilitating economic growth, including through:

- growth in the sector itself—manufacturing is typified by high levels of productivity growth
- innovation—innovations developed in one firm can encourage innovation or spill over into other parts of the economy
- the development of human capital—manufacturing may encourage the development of knowledge and attract and retain high skilled workers.

In 2013-14, manufacturing research and development (R&D) accounted for 20 per cent of total private R&D undertaken in Queensland in 2013–14. Of this, approximately 60 per cent was spent on traditional manufacturing disciplines including: machinery and equipment manufacturing, food product manufacturing, transport equipment manufacturing, and furniture and other manufacturing.\(^6\)

\(^1\) High technology exports are comprised of pharmaceuticals, medical equipment, scientific equipment, aircraft, computers, electronic equipment, photographic goods and telecommunications.
Queensland manufacturing has faced significant challenges in recent years. This may have contributed to its decline as a proportion of the economy. The manufacturing landscape is changing and provides Queensland firms with new opportunities. Changes include: a lower Australian dollar, changing consumer preferences toward high-quality specialised goods, technological advancements, a transition from cheap labour manufacturing to skill-based technological manufacturing, improved supply chains, and an increasing number of free trade agreements.

Current thinking on the future of Australian manufacturing suggests that one of Australia’s comparative advantages lies in high-value, low-volume manufacturing—-with a strong focus on design, R&D and innovation.

Australia’s mindset about manufacturing must change. Australia cannot compete with low-cost, high-volume production. Our future is not in traditional assembly line production. It is in advanced manufacturing and opportunities in the global supply chain.

Given Queensland manufacturing is less reliant than other states on the traditional trade-protected assembly line production (such as is involved in car manufacturing), this transformation may not be as significant. Queensland’s current manufacturing industries, supported by the relative competitive and comparative advantages they enjoy, are likely to continue to produce the majority of the sector’s output for the foreseeable future. Although new manufacturing opportunities will arise, it is likely that firms in existing industries will continue to be a major contributor to growth.

Production activity in Queensland presently varies from relatively rudimentary processing and more traditional manufacturing approaches (where products are assembled along production lines) to more complex transformation processes and techniques. Increasingly, innovative businesses are looking for ways to apply advanced technologies and develop highly skilled workforces to control input costs and leverage capabilities:

Manufacturing stands on the threshold of a major transformation ... Advanced manufacturing entails more than making high-tech products, and includes the use of new, often leading-edge machines and processes to make products that are unique, better, or cheaper. Advanced manufacturing also facilitates rapid integration of process improvements, readily permits changes in design, such as new part features or substitute materials, and accommodates customisation and cost-effective low-volume production.
Box 1: Advanced Manufacturing

Advanced manufacturing incorporates niche market products and a range of activities from design and research and development (R&D), to production, distribution and after-sales services. It focuses not only on products but also on value-adding across the entire value chain and includes:

- collaborative R&D and design-led thinking
- innovative business models and effective supply chain capabilities
- the effective use of disruptive technologies and systems and cutting-edge materials
- a focus on customisation and exports
- world-best practices and processes
- new ways to manufacture existing products and the manufacture of new products, and
- the provision of high value-added services and innovative solutions.

Manufacturing and innovation

Innovation is an important driver of productivity growth both for the manufacturing sector and the broader economy.

In competitive markets, successful firms create value by improving product quality, developing new products, finding new markets and reducing their cost of doing business. The focus not simply on what customers currently want and value, but also their future needs. Manufacturers continue to compete for inputs, such as skilled labour, with the mining and services sectors, and face continuous pressure to reduce their prices from strong overseas competition.

Innovation involves the creation and adoption of a new or significantly improved good or service, or a new organisational approach in business practices, workplace organisations or external relations.

Technology often plays a key role.

For many firms, the economic benefits from technology come from its use (adaptation or adaption) rather than its production.

Queensland businesses have benefited enormously from the adaptation and use of information and communication technologies even though little is produced or manufactured locally.
Outlook for manufacturing in Queensland

Innovation changes the types of goods available—and how they are produced, distributed and consumed. This often involves creating new opportunities that leverage off existing knowledge, practices and processes. An example that leverages Indigenous knowledge to create manufacturing opportunities is given in Box 2.

**Box 2: Leveraging Indigenous knowledge to create manufacturing opportunities**

Researchers from the Australian Institute for Bioengineering and Nanotechnology at the University of Queensland are working with the Indjalandji-Dhidhanu People of the Camooweal region in north-west Queensland to explore opportunities for commercial spinifex harvesting and processing. The joint research project uses advanced materials engineering and nanotechnology to extract extremely strong microscopic fibres (nanocellulose) from spinifex grasses, which can then be used to enhance the strength and toughness of plastic, rubber and latex compounds. These advanced methods build on the traditional knowledge of local spinifex grasses and its long history being used as an adhesive.\(^\text{12,13}\)

Innovation to strengthen productivity and competitiveness in the manufacturing sector (and other sectors) is fundamentally an activity of enterprises. The capacity for firms to innovate will vary across sectors and between firms and will depend on:

- how relevant innovation is the firm’s business strategy
- the quality of management and skilled workers
- whether organisational cultures exist to support sustained innovation
- the quality and depth of existing skills (technological, operational and managerial)
- the firm’s capacity to capture the full value of innovations.

As new technology and more advanced manufacturing practices are adopted, enterprises are increasingly reliant on the availability of skilled labour. It is important that workers have the right level of education and training to enable them to meet the requirements of a modern manufacturing labour market.

**Manufacturing and globalisation**

Globalisation has brought increased competition but also provides opportunities of access to new markets and inputs for Queensland products:

> Globalization creates increased opportunities for manufacturers to collaborate as suppliers become part of a connected manufacturing system, thereby enhancing the overall supply capability of the nations involved. Indeed, as the global economy and manufacturing technologies became more integrated and complex, global manufacturing networks and innovation ecosystems have followed suit.\(^\text{13}\)

Global value chains are evolving rapidly, with small and flexible manufacturers now able to supply components of global products using well-coordinated supply chains and advanced technology.

To be part of new markets and value propositions, manufacturers are required to identify sections of growth and position themselves to influence those products.\(^\text{8,14}\) The critical issue is identifying what activities add most value, particularly when some lower value manufacturing activities may be performed more cheaply in overseas markets, especially in emerging economies. An example is in Box 3.
Box 3: The iPhone story

The Apple iPhone and iPad provide some useful insights into global supply chains and how they impact on modern manufacturing.

Analysis by the University of California shows that, while the iPhone and most of its components are manufactured in China, the primary benefits accrue to the US economy.

This is because Apple keeps most of its high wage functions, including product design, software development, product management and marketing in the US with low cost (in this case, assembly) jobs undertaken in China.\(^\text{15}\)

Have your say

*What are the new growth areas for Queensland’s manufacturing sector?*

*What are the key challenges for Queensland’s manufacturing businesses?*

*What are the key pathways through which the manufacturing sector contributes to economic growth and productivity improvements across the broader economy?*

*Does manufacturing in Queensland aid technology diffusion across firms or encourage skill development in the broader workforce? How?*

*What are the new technologies and processes that are transforming manufacturing industries around the world? How widely used is this technology in Queensland’s manufacturing sector?*

*What factors restrict Queensland firms in adopting advanced manufacturing processes and systems?*

*How are the new technologies impacting on skill requirements? What are the key skills required for participation in global manufacturing supply chains?*

*Are education and training providers producing graduates with the necessary competencies? If not, what are the skill gaps?*

*How do global supply chains impact manufacturing in Queensland? Are there barriers in accessing global markets?*
4 Drivers of manufacturing growth

In an increasingly globalised market, the commercial success of a manufacturing business is built upon productivity and competitiveness. To survive and prosper, firms need to deliver those products that customers value most highly at the lowest cost. Where they are unable to do so, commercial opportunities and market share will be lost.

A number of factors impact on productivity and competitiveness to drive growth in the sector, including:

- labour productivity and skills
- the level of successful R&D, and the capacity of firms to innovate
- business costs and supply chain efficiency
- government regulations and policies (including tax, employment relations, education training, transport, energy and innovation policy)
- the exchange rate (as it determines the relative price of inputs and outputs).

Box 4: Competitiveness indicators

While there are many global studies that look at competitiveness, they generally include indicators for Australia rather than Queensland. These studies tend to suggest that Australia has many strengths, such as good institutions and abundant natural resources, a generally well educated population, is relatively corruption free and an attractive place to live.

A 2016 report from the World Economic Forum ranked Australia’s competitiveness 22nd out of 138 nations, a modest performance relative to other developed countries. It found Australia to be relatively more competitive in terms of health and primary education, higher education and training and financial market development while it was relatively less competitive in terms of goods market efficiency and labour market efficiency.

While the literature suggests that a number of factors are impacting on Australia’s competitiveness, the biggest challenges were in relation to innovation and business sophistication, where:

Australia not only lags far behind the best performers but also loses ground to them.

Notwithstanding variability in the quality of management practices both across countries and between firms in the same country, Australia’s managerial performance overall was found to be average.

In relation to manufacturing competitiveness, a 2016 review by Deloitte ranked Australia 21st out of 40 nations. The need for greater collaboration between universities and industry, and an increase in the number of students in science, technology, engineering and mathematics disciplines has been suggested by a number of analysts.

The poor perception of manufacturing in Australia was also considered to be holding the industry back and, as a result, successes needed to be highlighted. Similarly, cultural factors were identified as playing a part in the success of manufacturing, and that Australians may not be as tolerant of business failure, may not be as entrepreneurial and have a lower appetite for risk.
Understanding the factors that influence business decisions to locate, invest or reinvest in Queensland (or relocate elsewhere) is also important. Queensland firms often contribute to domestic and global value chains where networks of firms across industries and regions interact with increased specialisation and complex production relationships.  

Within a (potentially global) marketplace, a number of factors can influence manufacturers’ location and investment decisions. The relative importance of each will depend, in part, on the nature of production and its relationship with other parts of the supply chain.

Costs are critical for manufacturers competing in a global environment. Costs include capital, labour and land, but also may include shipping, tariffs, language barriers, time, and financial transaction fees, which affect the viability and total cost of manufactured products.  

Access to inputs and raw materials may be primary drivers for some manufacturers (such as food processors and metal products processors). Other manufacturers may choose a location that is close to key customers, increases access to emerging markets or takes advantage of specialised industry clusters or the talent of local suppliers.

In these cases, location decisions move beyond simply seeking input cost advantages to: identifying and mitigating ‘hidden costs’ (strengthening the supply chain and reducing risk in the event of adverse shocks); and creating customer value (being more flexible and responsive to changes in customers’ needs).

Location decisions become particularly important in the context of recent moves by some manufacturing firms (in particular in the United States and United Kingdom) to return previously off-shored production to their home countries—a process referred to as reshoring.

**Box 5: Reshoring**

Since the 1970s, manufacturing firms in the world’s advanced nations have relocated elements of their manufacturing process to countries in South East Asia and Eastern Europe, particularly to lower production costs. Over time, this has transformed nationally-based manufacturing industries into global networks of design, production and distribution.  

Reshoring is a reversal of this process. It does not necessarily involve the repatriation of all of the company’s offshore functions and activities or the closure and relocation of a whole plant. At its very broadest level, a reshoring strategy could include making new greenfield investment in plants that might have previously gone overseas.

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2 Queensland manufacturers can be users of foreign inputs or suppliers of intermediate goods and services that are then used in other economies’ production processes. Not all firms will be all equally engaged in global value chains, just as they are not equally engaged in international trade.
Several reasons are mooted for the growing interest in reshoring for some manufacturers. These focus on a changing global environment (with increasing costs of production in emerging countries and rising freight costs), the risks of operating extended supply chains (and a desire for greater control) and increased customer focus.\textsuperscript{21–23}

Despite its growing appeal, there is, to date, limited evidence on the extent of (or potential) for reshoring in the manufacturing sector.

\begin{quote}
While company surveys and anecdotal evidence suggest the growing importance of the reshoring trend, the more aggregate evidence ... indicates that the effects on national economies are (still) limited.\textsuperscript{24}
\end{quote}

\begin{quote}
... the reshoring phenomenon, once viewed by many as the leading edge of a decisive shift in global manufacturing, may actually have been just a one off aberration ... the 2015 data confirms that offshoring seems to only be gathering steam, while the U.S reshoring train that so many predicted is yet to leave the station ... the recent increase of nearshoring to Mexico also seems to indicate that, even if US companies consider leaving Asia, they may choose to stop south of the border.\textsuperscript{25}
\end{quote}

In developed economies, reshoring activities may be more prevalent in technological and quality products characterised by fast product cycles where feedback from the market is important.\textsuperscript{10} In addition, shifts in technology that fundamentally change cost dynamics across the supply chain will also increasingly factor into reshoring decisions.\textsuperscript{25}

\begin{table}
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\textbf{Have your say} \\
What are the key factors driving a productive and competitive manufacturing sector? Are there relationships between these drivers? \\
What is the capacity of the Queensland Government to influence these drivers? \\
What factors influence a company’s decision to locate its operations in Queensland? \\
What are the sources of competitive advantage that manufacturing businesses in Queensland have over interstate and international rivals? \\
What is the extent of offshoring undertaken by Queensland manufacturing firms? \\
What has been the international experience of reshoring? \\
What are the potential benefits of reshoring for the Queensland manufacturing industry and the Queensland economy in general? \\
What are the barriers to Queensland firms reshoring? \\
\hline
\end{tabular}
\end{table}
5 Government policies and programs

There are a range of government policies, across all levels of government, that directly or indirectly relate to manufacturing industries. A sample of these policies and programs are identified in Table 1.

For manufacturing businesses, governments influence the overall business operating environment and wider economic policies (taxation, employment relations policy and welfare payments).

More direct policy measures can include:

- grants or subsidies—for example, to assist in product development or stimulate innovation
- trade barriers—such as tariffs and quotas on competing imports to ‘protect’ domestic production
- industry facilitation and support programs—including providing incentives to produce locally
- programs to bolster research, increase collaboration and accelerate commercialisation—for example, through Cooperative Research Centres
- education and skills development programs.

Specific measures are often targeted at small businesses, specific industries or particular technologies. Examples include reducing barriers to innovation through the reduction of costs (either through grants, subsidies or tax concessions), providing networking and collaboration opportunities, promoting industries, and training.

The Queensland Government has a number of initiatives aimed at helping manufacturing businesses improve competitiveness, productivity and performance. These programs are part of a broader set of Queensland Government initiatives, including the $405 million Advance Queensland program, as well as strategies to support small business and improve education outcomes in Queensland.

The Queensland Government has identified advanced manufacturing as a priority industry sector. The Queensland Government is working with the Industry and Manufacturing Advisory Group, which has a focus on assisting manufacturing businesses maximise domestic and international opportunities, to develop a 10-year Advanced Manufacturing Roadmap (AM Roadmap) to guide the development of the sector.39

Governments also provide industry assistance to the manufacturing sector, for example:

- the Queensland Government provides over $200 million per year in industry assistance to the Queensland manufacturing sector (primarily through tax concessions available to all Queensland businesses, rather than direct budget assistance)
- the Australian Government provides assistance through tariffs, budgetary outlays and tax concessions ($1.3 billion in 2012–13)
- local governments provide support through the development of infrastructure, planning and development concessions, access and use of council land, council rate reductions and the waiving of charges.26
How can government best support the manufacturing sector?

Governments become involved in markets for a range of reasons. At one level, they play a vital role in facilitating economic growth by establishing appropriate frameworks through robust economic and legal institutions (such as secure property rights, rules of law and core public services). Beyond this, they take action to address market failure, as well as to achieve particular economic and social objectives.

**Box 6: Government involvement in the manufacturing sector**

Governments may intervene in the manufacturing sector to:

- protect against (or correct) a range of market failures including:
  - addressing 'free rider' problems—including where firms are able to capture the benefits of having a highly skilled workforce (who have been trained by other firms), creating disincentives within the industry to undertake training and skill development themselves
  - addressing knowledge spillovers—where businesses are unable to capture privately the full returns from their own R&D, reducing incentives for the industry to undertake a socially optimal level of R&D
  - accounting for costs (or benefits) that are not otherwise reflected in the market prices—including where the environmental consequences of processes on unrelated third parties (pollution) are not accounted in private production decisions
  - overcoming information failures in the market—including when firms or consumers have insufficient information to make optimal decisions (for example, through food safety requirements and labelling laws)
- address system failures and coordination problems that can restrict innovation systems, hinder the flow of knowledge and technology and reduce the overall efficiency of R&D efforts—including through a national innovation systems approach
- support communities and target regional development following the closure or downturn of major employing industries—by providing adjustment packages such as job search and training assistance for workers and grants for businesses to invest in plant and equipment
- support ‘infant industries’ on the basis that they could become viable over time, but require initial government assistance
- promote regional economic development and employment—including through shaping the general business environment and by providing specific incentives for firms to locate operations in particular regions
- mitigate the ‘high costs’ of doing business and the impacts of assistance provided in other countries, or other government regulatory/policy distortions
- addressing health and safety concerns—including workplace health and safety.
The existence of a policy problem does not automatically support a role for government. Competition between existing businesses, and the threat of entry from new ones, will provide a powerful stimulus for businesses to seek out new opportunities and improve business practices. Firms and individuals may resolve problems over time. For example:

...global corporations are supporting incubator models as a way of accessing technological innovations. In 2013 Telstra launched muru-D to provide early-stage technology entrepreneurs with mentoring, tailored acceleration services, investment finance and office space. Its goal is to help Australia and SE Asia become a centre of digital business.

Moreover, policies are not without costs and may create distortions in the market.

An effective government response to a policy problem can improve outcomes but, if unsuccessful, can introduce new inefficiencies, have unintended impacts, as well as, impose compliance and administration costs. As a result, the key test is whether government action can induce beneficial change that would not occur without it, and whether the benefits of that change outweigh the costs for the Queensland community.

**Have your say**

How effective have the Queensland Government manufacturing sector policies and programs been in achieving their objectives?

What lessons can be learnt from the design of existing policies? Are there examples of best practice or innovative solutions?

Are there policies or initiatives that that have been effective in other jurisdictions (including internationally)? Why were these successful?

What are the costs and benefits of current policies (including impacts on resource allocation, spillovers, administration costs for Government and compliance costs for business?)

What should be the respective roles for the Australian and Queensland Governments manufacturing industry policy? Where can government action provide best value?
Table 1 A sample of government policies and programs available to Queensland manufacturers

<table>
<thead>
<tr>
<th>Queensland</th>
<th>Commonwealth</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Regional Innovation Hubs</strong> connect local efforts, drawing on strengths</td>
<td><strong>Innovative Manufacturing Cooperative Research Centre</strong> supports manufacturing</td>
</tr>
<tr>
<td>and improving the capability of innovative local firms.</td>
<td>innovation in key growth sectors.</td>
</tr>
<tr>
<td><strong>Platform Technology Program</strong> supports the development and deployment of</td>
<td><strong>Advanced Manufacturing Growth Centre</strong> increases business, industry and</td>
</tr>
<tr>
<td>platform technologies (e.g. unmanned aerial vehicles) across existing and</td>
<td>research collaboration.</td>
</tr>
<tr>
<td>emerging industries such as aerospace, agriculture, defence, disaster</td>
<td><strong>Research and Development Tax Incentive</strong> provides a tax concession on R&amp;D</td>
</tr>
<tr>
<td>management and environmental monitoring.</td>
<td>investment.</td>
</tr>
<tr>
<td><strong>Ignite Ideas Fund</strong> assists businesses developing new or improved</td>
<td><strong>Other jurisdictions</strong></td>
</tr>
<tr>
<td>products, processes or services to secure investment, grow and launch into</td>
<td><strong>Minimum viable product grants</strong> assist in the initial phase of product</td>
</tr>
<tr>
<td>global markets.</td>
<td>development (NSW).</td>
</tr>
<tr>
<td><strong>Business Development Fund</strong> co-invests in emerging and high-growth</td>
<td><strong>Skills Tasmania Advanced Manufacturing Skills Initiative</strong> contributes to</td>
</tr>
<tr>
<td>businesses commercialising innovative research or ideas.</td>
<td>relevant and appropriate workforce development, skills and training in the</td>
</tr>
<tr>
<td><strong>Knowledge Transfer Partnerships</strong> assist in the employment of graduates</td>
<td>advanced manufacturing sector (Tas).</td>
</tr>
<tr>
<td>on strategic innovation projects. Collaboration and knowledge transfer to</td>
<td><strong>Business Innovation Support Initiatives Voucher Scheme</strong> is designed to</td>
</tr>
<tr>
<td>occur through business partnerships with universities when selecting</td>
<td>stimulate, initiate and promote innovation (NT).</td>
</tr>
<tr>
<td>graduates.</td>
<td><strong>Business and Innovation Centres</strong> brings together research and education</td>
</tr>
<tr>
<td><strong>Innovate Queensland</strong> delivers, through a third party, skills-based and</td>
<td>institutes for collaboration and networking (ACT).</td>
</tr>
<tr>
<td>collaborative solutions for businesses and early stage innovators seeking</td>
<td><strong>International marketing and promotion</strong> supports innovation initiatives</td>
</tr>
<tr>
<td>innovation and technology commercialisation. This will specifically target</td>
<td>(WA).</td>
</tr>
<tr>
<td>innovative, knowledge intensive businesses, including the advanced</td>
<td><strong>Future Industries Manufacturing Program</strong> provides funding to implement new</td>
</tr>
<tr>
<td>manufacturing sector.</td>
<td>manufacturing technologies and processes (Vic).</td>
</tr>
<tr>
<td><strong>Innovation Partnerships</strong> incentivise Queensland research organisations</td>
<td><strong>Business Transformation Voucher Program</strong> encourages profitability through</td>
</tr>
<tr>
<td>to collaborate with industry on research projects.</td>
<td>increased diversification, process improvement and innovation (SA).</td>
</tr>
<tr>
<td><strong>Commercialisation Partnership Program</strong> provides access to Chinese</td>
<td><strong>Advancing Small Business Queensland Strategy</strong> advocates, enables and</td>
</tr>
<tr>
<td>incubators for global collaboration and the acceleration of commercial</td>
<td>empowers small businesses to start, grow and employ.</td>
</tr>
<tr>
<td>outcomes for Queensland innovators.</td>
<td><strong>Queensland Charter for Local Content</strong> provides local firms with</td>
</tr>
<tr>
<td><strong>Small Business Innovation Research</strong> provides commercial opportunities</td>
<td>opportunities to tender for Queensland Government projects and procurements.</td>
</tr>
<tr>
<td>to solve Queensland Government challenges.</td>
<td><strong>Advancing education</strong> provides an action plan for education in Queensland.</td>
</tr>
</tbody>
</table>

**Queensland Productivity Commission**
6 Structural adjustment and the community

Structural adjustment, or change, involves relatively large and long-lasting transformations in the composition of production in the economy often affecting the relative size and characteristics of industry. It is an ongoing characteristic of economic development. With the reallocation of economic resources to more profitable uses, new industries develop while others may experience economic decline or even disappear.

Structural change is necessary if communities are to take advantage of growth opportunities and enhance their living standards. Change may impose costs on workers, firms and other groups in the community as economies transition away from industries in decline.

The costs of structural change may be severe, particularly where communities rely heavily on the affected industry for economic opportunities, such as employment. Costs may be more acute where businesses and workers are unable to adapt and reposition themselves in a changing market, due to skill mismatches or an inability to relocate, impeding the transition process.

Box 7: Structural adjustment in Australia

Structural change has been a prominent feature of the manufacturing industry in Australia since the removal of tariffs on manufacturing imports and other industry protection measures in the 1980s and 1990s. Many manufacturing firms and employees, particularly those in metropolitan areas, were able to adjust successfully over time without government assistance.

In parts of regional Australia, where the affected industry had a strong presence, the Australian Government, in partnership with relevant state governments, provided region-specific structural adjustment packages.

As an example, following the automotive industry’s decision to reduce its workforce in Geelong, job search and training assistance was provided to affected employees. New businesses were offered grants to encourage investment in plant and equipment.

The effectiveness of assistance measures is difficult to measure. Analysis has found that assistance projects historically: have a high cost per job; insignificantly affect overall long term regional employment trends; and do not enhance regional performance relative to other regions that lose a major employer but did not receive assistance.

Given Queensland’s manufacturing diversity, and absence of sectors supported by high trade barriers, it has been relatively immune to these structural shocks — and has experienced relatively low levels of structural change compared to some other Australian states. Even so, in some circumstances, there may be a role for government to provide assistance to facilitate community adjustment and recovery.

The basis for any government intervention and the underlying policy objectives of any assistance package should be clear. Adjustment assistance is usually provided on the grounds of equity or fairness. It may also be justified on the basis of efficiency, for example to overcome product and labour markets that are not functioning properly.
When a case for government support is identified, this assistance must be suitably targeted and the measures effective. It should also have regard to costs met by government and the wider community. In its *Report on Industry Assistance in Queensland*, the Queensland Competition Authority proposed a number of principles to guide the design of structural assistance packages:

- Adjustment assistance should facilitate, rather than impede, industry adjustment to market conditions.
- The rationale for assistance is generally stronger for workers than for business, as most workers cannot readily diversify risk and are relatively poorly informed about such risks when making employment decisions. In addition, assistance provided directly to workers rather than business is less likely to impede efficiency enhancing industry change.
- Assistance is normally better provided through general welfare and employment programs rather than selective support:
  - Selective support is warranted only where adjustment costs are significant and systematically different to those experienced by other industries, firms or workers adjusting to change.
  - Where assistance is justified on equity grounds, it is normally more effectively and efficiently provided through the general welfare system, as this can directly target those in need without unduly introducing inefficiencies in the market.96

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**Have your say**

*What are the economic and social impacts of structural adjustment on businesses, workers and the community?*

*Have areas of regional Queensland been adversely impacted? If so, to what extent?*

*What should be the objectives of Government in providing structural adjustment assistance?*

*What forms of structural adjustment assistance that apply specifically to the manufacturing sector are available to firms, employees or affected communities? How successful have these packages been in the past? Are there better solutions?*

*What forms of Government assistance have other countries provided in response to a decline in their manufacturing sectors?*

*What should be the main policy criteria for the provision of structural adjustment assistance?*
Governments introduce regulations as a way to improve economic, social and environmental outcomes, or to reduce undesirable outcomes. These benefits may not occur if left to markets to deliver.

Although regulations can bring benefits, they may also impose costs. The challenge for government is to deliver regulation that effectively addresses a problem whilst ensuring new regulation provides an overall benefit to the community.

Much of the regulation affecting the Queensland manufacturing sector is set at a national level; however, the Queensland Government continues to have an important regulatory role that can influence industry performance, productivity and competitiveness. For example, Safe Food Production Queensland regulates food safety matters relating to the production and processing of primary produce.\textsuperscript{44}

As some manufacturing businesses are, or will be, increasingly globally interconnected through global supply chains, international regulation and standards are also important.

Many regulations do not directly target the manufacturing sector, but nevertheless are a potential source of burden to manufacturing businesses. Consumer protection provisions, occupational health and safety requirements, transport frameworks and environmental requirements affect all businesses, including manufacturers. In these cases, the Commission is particularly interested in exploring those regulations that have a particular or discriminatory impact on manufacturing businesses or workers, beyond the burden applied to business more broadly.

Queensland manufacturers must comply with multiple layers of regulation that can cut across different aspects of their activities, as illustrated in Figure 9. The Commission has been asked to investigate and report on the Queensland regulatory framework and changes that may reduce the regulatory burden for manufacturing in Queensland.

### Have your say

What are the Queensland Government regulations that currently apply to manufacturing industries?

What are the costs and benefits of regulations? Are there any adverse or unintended impacts?

How could regulation be improved?

Are there any alternatives to these regulations that would achieve the same objectives?

Are there regulations that could be removed or revised on the basis that their costs outweigh their benefits?

Do the existing regulatory arrangements act as an impediment to the development and implementation of new manufacturing processes and business models? If so, which and how?

\textsuperscript{44} Food Standards Australia New Zealand have developed food standards that apply nationally and are mandatory for each State and Territory to adopt. Primary production and processing standards have been developed for dairy production, collection and processing, egg and egg products, meat and meat products, poultry, seafood products and plant and plant products.
Figure 9  Regulations for manufacturers

<table>
<thead>
<tr>
<th><strong>Australian Government</strong></th>
<th><strong>Queensland Government</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>National land transport regulatory frameworks</td>
<td>Upstream supply activities</td>
</tr>
<tr>
<td>Shipping and maritime safety laws</td>
<td>Transport</td>
</tr>
<tr>
<td>International maritime codes and conventions</td>
<td>Food safety</td>
</tr>
<tr>
<td>Competition and consumer law</td>
<td>Workplace Health and Safety</td>
</tr>
<tr>
<td>Environmental protection and biodiversity conservation</td>
<td>Acquisition of premises</td>
</tr>
<tr>
<td>Financial sector (access to finance)</td>
<td>Land use and planning</td>
</tr>
<tr>
<td>Workplace Health and Safety</td>
<td>Building code</td>
</tr>
<tr>
<td>Industrial relations</td>
<td>Retail tenancy</td>
</tr>
<tr>
<td>National pollutant inventory</td>
<td>Food production safety</td>
</tr>
<tr>
<td>Immigration</td>
<td>Machinery operations</td>
</tr>
<tr>
<td>Water access</td>
<td>Local government rates and charges</td>
</tr>
<tr>
<td>Industrial, agricultural and veterinary chemicals</td>
<td>Land use and planning</td>
</tr>
<tr>
<td>Trade measurement</td>
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<tr>
<td>Export certificates</td>
<td>Logistics and distribution</td>
</tr>
<tr>
<td>National land transport regulatory frameworks</td>
<td>Transport</td>
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<tr>
<td>Shipping and maritime safety laws</td>
<td>Food production safety</td>
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<tr>
<td>International maritime codes and conventions</td>
<td>Workplace Health and Safety</td>
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<tr>
<td>Competition and consumer law</td>
<td>Building code</td>
</tr>
<tr>
<td>Product safety</td>
<td>Local government rates and charges</td>
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<tr>
<td>Competition and consumer law</td>
<td>Hazardous goods handling and transport</td>
</tr>
<tr>
<td>Corporation law</td>
<td></td>
</tr>
<tr>
<td>Redundancy provisions</td>
<td>Cessation of operations</td>
</tr>
<tr>
<td></td>
<td>Contaminated sites</td>
</tr>
<tr>
<td></td>
<td>Land use and planning</td>
</tr>
</tbody>
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Appendix A: Terms of reference

Terms of Reference

Inquiry into Queensland Manufacturing

In accordance with section 23 of the Queensland Productivity Commission Act 2015, I hereby direct the Commission to undertake an Inquiry into Queensland Manufacturing, including a review of international resourcing initiatives.

Background

Queensland's manufacturing sector is a significant contributor to employment, as well as regional and economic growth within the State. In 2014-15, the industry contributed over $20 billion to the Queensland economy. Despite this significant contribution, manufacturing's share of State output declined from around 12 per cent in 1989-90 to around 7 per cent in 2014-15.

While there are significant emerging opportunities, the manufacturing sector is also facing a number of challenges including business costs and regulation, skills shortages and strong emerging international competition. To remain competitive, the manufacturing sector will need to adapt and reposition itself to address these challenges and take advantage of emerging opportunities. This will include building the management and workforce skills and knowledge required to drive productivity and innovation.

Opportunities exist for the manufacturing sector to build on existing competitive advantages and advanced manufacturing niches, gain access to new domestic and international supply chains and other value-adding market opportunities, capitalise on export opportunities, apply advanced technologies, and foster a highly skilled manufacturing workforce. A reinvigorated manufacturing sector, using advanced manufacturing techniques in particular, has the potential to bring significant productivity gains and employment growth.

To achieve this, it is essential that the State's manufacturing businesses operate within a supportive business environment that encourages innovation, investment and growth.

Scope

The objective of the Inquiry is to develop policy options to improve the productivity and competitiveness of the manufacturing sector in Queensland. In this regard, the Inquiry should focus on opportunities to maximise existing advantages, improve weaknesses and take advantage of emerging domestic and international opportunities.

In undertaking the Inquiry, the Commission should investigate and report on:

(1) the role of the manufacturing sector in advancing economic growth and productivity in Queensland;

(2) the changing nature of Queensland manufacturing, including its composition, location, employment size and structure, and linkages with service industries and international supply chains;

(3) the manufacturing sector's performance and potential, including a focus on employment and exports;

(4) the characteristics of a productive and competitive manufacturing sector (noting the diverse nature of manufacturing in Queensland), including a focus on innovation and skills utilisation to promote longer term productivity improvements;

(5) opportunities to improve the performance, productivity and competitiveness of the Queensland manufacturing sector;
(6) experience from other jurisdictions, including in respect of reshoring initiatives (for example, the reshoring initiative in the United Kingdom);

(7) the regulatory framework for manufacturing in Queensland, including changes that would reduce the regulatory burden on the manufacturing sector; and

(8) the effectiveness of current policy settings for the manufacturing sector, and changes that would facilitate improved performance, productivity and competitiveness.

Public consultation

In accordance with section 25 of the Queensland Productivity Commission Act 2015, the Commission must undertake public consultation in relation to the Inquiry. This should include consultation with a diverse range of stakeholder groups including large and small manufacturers, key interest groups and affected parties, the Industry and Manufacturing Advisory Group, regulatory bodies, employee associations, government agencies, councils and research bodies.

Reporting

References


