

# Adding Value

The critical, enabling role of the chemicals and plastics industry for Australia's future



A Strategic Roadmap for the chemicals and plastics industry



## About this Roadmap

This roadmap is the result of extensive independent consultation and analysis, which led to two significant CSIRO reports.

The first, *Elements in Everything*, examines the Australian chemicals and plastics industry's current profile and future trends.



The second, *Strategic Directions*, discusses how the industry can achieve sustained growth by taking advantage of major global and domestic economic, social and environmental shifts known as Megatrends (see page 4).



These reports follow consultation with industry leaders, government, research agencies and community groups, and a workshop with experts in international business, demographics, environment and climate, and minerals and resource management.

## The Plastics and Chemicals Industries Association

The Plastics and Chemicals Industries Association is the pre-eminent national body representing Australia's chemicals and plastics industry. It is the second largest manufacturing industry in Australia, and provides industry value-add of \$11.6 billion.

PACIA members include chemicals manufacturers, importers and distributors, logistics and supply chain partners, raw material suppliers, plastics fabricators and compounders, plastics and chemicals recyclers and service providers to the sector.

For more information visit:  
[www.pacia.org.au](http://www.pacia.org.au)

The chemicals and plastics industry vision is:

"A vibrant and sustainable industry in Australia, providing the building blocks of a modern economy and central to the country's economic, environmental and social wellbeing."

## Critical Industry Enabler

The chemicals and plastics industry supplies inputs to 109 of Australia's 111 industries



# This Roadmap and Why Australia Needs It

**Chemicals and plastics are essential for our continued health, safety and quality of life. Evidence of this invaluable contribution is around all of us, every day.**

Fresh, safely packaged food from productive farmland; safe drinking water delivered into our homes; disease and infection controlled by hygiene and cleaning products, medical equipment and pharmaceuticals – all delivered by modern chemistry and built into the products and services we rely on.

The Australian chemicals and plastics industry can help meet the demands of global and domestic growth while continuing to add significant value to the national economy by enabling companies and supply chains to manufacture essential products and services.

As growing populations seek higher living standards from limited resources, chemistry will continue to deliver sustainable solutions. These solutions include more productive and nutritious crops to feed a hungry world, and insulation materials, lightweight vehicles and renewable energy technologies that reduce reliance on fossil fuels.

This roadmap plots a course for the short, medium and longer term to achieve the industry's vision and secure long-term benefits for Australia's economy, society and environment.

At the heart of the document is the belief that Australia will benefit from a balanced economy that adds value to its resources through a healthy manufacturing sector in which the chemicals and plastics industry drives innovation and sustainable growth.

The Australian chemicals and plastics industry has been described as the 'anchor' of the modern economy.

But the industry has reached a critical tipping point that requires urgent action.

The nation's traditional 'below ground' advantages of abundant natural resources, allied with 'above ground' advantages of a skilled and capable workforce; a good health, safety and environmental performance; and stable financial and political systems are being offset by several significant roadblocks to the flow of global capital required to sustain and grow the industry.

This roadmap is a strategic plan that outlines how the industry can work with governments and other stakeholders to remove these roadblocks so that it can take advantage of opportunities, especially in Asia and the developing world, to achieve sustainable growth.

The chemicals and plastics industry welcomes the significant opportunities this roadmap presents. We look forward to working with other leaders to add value to the Australian economy.

## Chemicals and plastics enabling the food value chain

### Agricultural production

- Fertilisers
- Seeds
- Animal Feed
- Veterinary chemicals
- Agricultural chemicals
- Nets and buoys
- Fuel and oils
- Pipes and irrigation
- Silage
- Netting and vine covers
- Grain bunkers
- Cleaners
- Sanitisers
- Packaging



### Food manufacturing

- Vitamins
- Additives
- Preservatives
- Insulation
- Refrigerants
- Fuel and Oils
- Cleaners
- Sanitisers
- Energy
- Packaging
- Storage
- Labelling
- Inks and dyes
- Security
- Tamper-proofing



### Distribution, wholesale, retail, food service

- Fuels and oils
- Insulated transport
- Refrigerants
- Insulation
- Packaging
- Security
- Labels
- Cleaners
- Sanitisers
- Detergents
- Baskets
- Trays
- Wrapping



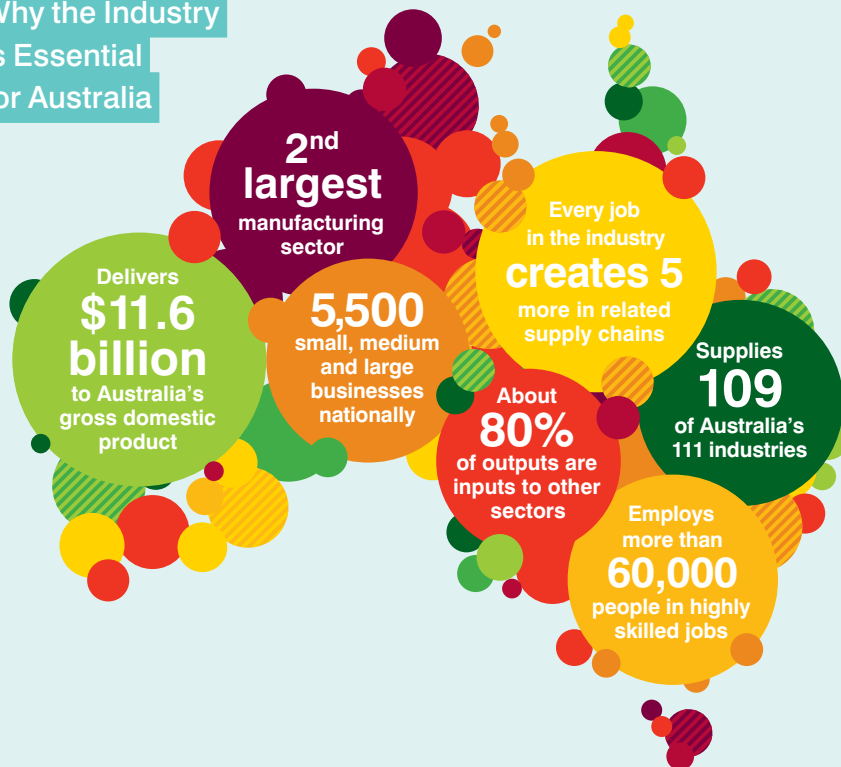
### Consumption: restaurants, homes, catering, institutions

- Nutrition
- Insulation
- Refrigerants
- Recyclable Packaging
- Heating and cooling
- Wrapping
- Cookware
- Utensils
- Cleaners
- Disinfectants
- Detergents
- Compostable Packaging



Food, energy and resource waste reduced by: preservatives, additives, smart packaging, refrigeration, insulation and composting of final residuals

## Why the Industry is Essential for Australia



Alternative trajectory

### Sustainable Growth

- Preserve everyday benefits
- Create jobs and economic growth
- Secure domestic supply chains
- Keep Australia a leader in global innovation

Current trajectory

### Industry Contraction

- Decreased output and jobs
- Increased reliance on imports
- Risk to supply chains
- Loss of means of production

## Current State of the Industry

The Australian chemicals and plastics industry faces significant challenges preventing it from enabling Australian industry taking advantage of opportunities in a competitive global and domestic environment.

Increased demand for chemicals and plastics is coming from global population growth and rising incomes, especially in developing nations.

In Asia and other growing economies, this demand is being met by industry with chemical plants that are newer, larger, more efficient and sophisticated than those in Australia – and closer to growing markets.

In recent years, the Australian industry has experienced:

- Domestic and customer production moving offshore
- Erosion of customer bases mainly due to broader manufacturing problems
- A growing trade deficit, due to increasing imports
- A stubbornly high dollar, resulting in high production costs
- Declining numbers of employees, businesses and production capability

The key roadblocks to growth are uncertainty around gas supply (for feedstocks and energy); inconsistent, complex, and costly regulation; and Australia becoming less attractive for capital investment.

## Megatrends

Food For All

Resource Scarcity

Emerging Markets

Responsible Industry

Technological Advances

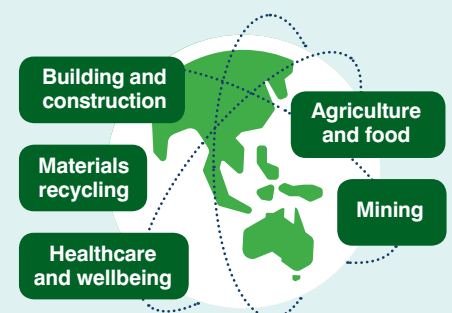
Health and Wellbeing

## Towards Sustainable Growth

The industry can grow; become strong, resilient and help to stimulate broader economic activity and preserve supply chain security.

This growth can occur only if it is in a strong position to take advantage of opportunities created by substantial shifts in global conditions, such as those identified in CSIRO's Megatrends.

Megatrends are signposts to business opportunities and new markets. CSIRO has identified the following market growth areas for the industry:



This invaluable industry is at the crossroads.

The time for reviews has passed; now it is time for action.

If it is to achieve sustainable growth, the industry needs to work with governments to remove roadblocks and get on with the business of working smarter, using its 'above ground' capacity to innovate and enable Australian industry to take advantage of new markets and opportunities.



High value Australian chemical products used in global and domestic supply chains can meet increasing demand from these markets.

This will help deliver sustainable growth for the industry, and add value to the Australian economy.









# Fundamental Needs For Industry

The industry has identified fundamental needs (key settings) that must be in place to put it on a path to sustainable growth.

In this roadmap, these fundamental needs are grouped into:

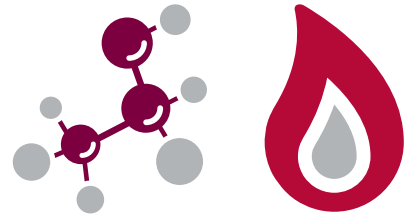
- **Urgent (short term, in red)**
- **Strengthen (medium term, yellow)**
- **Maintain (long term, green).**

PACIA is calling for the following Key Actions:

Urgent: Short Term		
Fundamental need	Actions for governments with industry	
	<b>Access to natural gas for feedstock and energy</b>	<ul style="list-style-type: none"> <li>• Immediate moratorium on new east coast LNG export plant approvals while a gas supply and price solution is sought</li> <li>• Facilitate gas supply to transformational industries by using the tax system, eg using a rebate of the Petroleum Resource Rent Tax and where applicable, state-based royalties and accelerated depreciation</li> </ul>
	<b>Balanced regulatory environment</b>	<ul style="list-style-type: none"> <li>• Ensure 'minimum effective regulation'</li> <li>• Reform NICNAS to deliver a respected efficient and effective scheme that supports innovation, investment and competition</li> <li>• Ensure national regulatory consistency by implementing COAG reforms to deliver a 'seamless national economy'</li> </ul>
	<b>Competitive capital</b>	<ul style="list-style-type: none"> <li>• Ensure Australia is an attractive investment destination by: <ul style="list-style-type: none"> <li>— Working with industry to remove roadblocks and improve investment incentives</li> <li>— Recognising the unique, strategic and transformational capability of the chemicals and plastics sector in investment and planning decisions</li> </ul> </li> </ul>
Strengthen: Medium Term		
Fundamental need	Actions for industry with governments	
	<b>Social licence to operate</b>	<ul style="list-style-type: none"> <li>• Companies that work with chemicals and plastics to commit to the Sustainability Leadership Framework and <i>Responsible Care</i>® programs</li> <li>• Implement education, awareness and engagement campaigns to improve recognition of industry's societal value</li> <li>• Government to ensure sound land use planning around chemicals and plastics plants</li> </ul>
	<b>Innovation and strong intellectual property</b>	<ul style="list-style-type: none"> <li>• Identify research, development and technology priorities</li> <li>• Match, align and facilitate R&amp;D capacity to industry needs</li> </ul>
	<b>Strong customer base</b>	<ul style="list-style-type: none"> <li>• Undertake market research to help industry respond to opportunities identified in the Megatrends (see page 4)</li> <li>• Make full use of trade delegations and other collaborative opportunities to explore new markets</li> <li>• Develop value-added services alongside products</li> </ul>
	<b>Skilled and productive talent</b>	<ul style="list-style-type: none"> <li>• Continually update workforce skills to remain ahead of challenges and opportunities</li> <li>• Collaborate to attract, train and retain skilled technical professionals</li> </ul>
Maintain: Long Term		
Fundamental need	Actions for governments with industry	
	<b>Stable financial and political systems</b>	<ul style="list-style-type: none"> <li>• Maintain the foundation that stable financial and political systems provide for investment</li> <li>• Maintain high corporate governance standards</li> </ul>



# Access to Natural Gas for Feedstock and Energy



**Access to long term and competitively priced natural gas supply as a feedstock to be transformed into usable products is the most important issue facing the chemicals and plastics industry.**

**Australia's abundant energy resources, such as gas, should be a major competitive advantage and enable a competitive chemicals and plastics industry to underpin a vibrant, resilient and balanced economy.**

However, the present regime for the regulation of the gas market is broken and without reform, poses a serious risk to the viability of the domestic chemicals and plastics sector and the industries that depend on it.

With reliable and secure supplies of feedstock at competitive prices, the chemicals and plastics sector will enable Australian industry to take advantage of the opportunities described in the Megatrends (see page 4). Without these supplies, the chemicals and plastics sector will not exist in its current state and Australian industry will be increasingly dependent on imports.

By creating a competitive, internationally viable gas market, governments can create long-term, high-value jobs, secure economic growth, maintain vital supply chains for industry and increase taxation revenue. It is equally possible to have long-term supply and pricing of gas for the chemicals and plastics industry and a competitive upstream market.

## Why this is important

The National Institute of Economic and Industry Research has found that for every \$1 gained in gas exports, \$21 to \$24 is forgone in domestic industrial production. That means that Australia gives up \$255 million in lost industrial output for every \$12 million gained in export output. The industry believes this is simply unwise.

With gas reserves of more than 430,000 petajoules – equivalent to about 184 years' production (*Prime Minister's Manufacturing Taskforce, 2012*) – it is policy settings that are broken not reality – policy settings are skewed towards LNG exports with no value add.

Australia's proximity to Asia has attracted foreign investment in LNG which has distorted the domestic gas market. Shortages domestically have pushed up prices while exports take apparent priority for supply into the competitive Asian market. This has clearly been an unintended consequence of current policy settings and means that long-term supply beyond 2016 to local industry is almost impossible to negotiate, creating a so-called 'gas cliff'. Natural gas prices in eastern Australia have already increased by more than 70 per cent and are likely to go higher (*Prime Minister's Manufacturing Taskforce, 2012*).

New LNG plants coming on stream on the eastern seaboard and an immature domestic gas market mean the chemicals and plastics industry has become the victim of a perceived shortage of gas and increasing prices. There are limited sources of gas for domestic use and supply and joint marketing arrangements from the available gas basins make competition almost impossible to achieve.

## What's in place

- All governments have failed to recognise the strategic importance of the chemicals and plastics industry to the Australian economy
- A failed gas market has seen significant lost opportunity in job creation, innovation and value added by the private sector
- The cost of production in Australia may be so high that there is a flight of capital, leading to significant job losses and a deteriorating balance of trade
- Security of supply and price is needed in the gas market to maintain existing plant at current levels, let alone convince owners of capital to invest additional amounts to continue to operate or even expand existing plant
- Opportunities are being lost for new investment as capital seeks security of supply and price for new investments
- Too many reviews of the industry without any concrete action for reform.

**Without these supplies, the chemicals and plastics sector will not exist in its current state**

## What needs to improve

### Governments need to:

- Implement the recommendations of the 2002 COAG report, *Towards a truly national and efficient energy market*, including a review of the Trade Practices Act to allow the ACCC to examine joint gas marketing agreements to improve upstream competition and supply
- Review the regulation of gas pipelines to remove uncertainty and where necessary reserve appropriate routes
- Promote competition in gas markets when awarding exploration leases and examine the use or non-use of existing exploration and production leases – the so-called ‘use it or lose it’ provisions

### Industry needs to:

- Invest in and maintain existing plant over time as a consequence of certainty of supply and price
- Strategically invest in the scale of the industry when renewing and improving investment
- Work with international chemicals and plastics industry participants to secure scarce investment capital for Australia.

## Actions PACIA is calling for

- Governments must recognise the strategic value of the chemicals and plastics sector to a strong, balanced national economy and for the improvement of Australian living standards
- Government must place an immediate moratorium on the approval of any new export LNG plants on the east coast of Australia while a comprehensive solution is sought for sustainable domestic gas supply and pricing
- Governments must facilitate gas supply to transformational industries such as chemicals and plastics by using the tax system, for example using a rebate of the Petroleum Resource Rent Tax and where applicable, state-based royalty regimes and accelerated depreciation allowances for new investments. Any revenue forgone in the short term would be recouped via increased employment, profitability and taxation revenue in the downstream market as well as the maintenance and enhancement of an integrated and developed Australian economy.



**For every \$1 gained  
in gas exports,  
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in domestic industrial  
production**

**Governments  
must recognise the  
strategic importance  
of the chemicals and  
plastics industry to the  
Australian economy**

# Balanced Regulatory Environment



**The Australian chemicals and plastics industry seeks effective and balanced regulation that protects workers, public health, the community and the environment while delivering a business operating environment that stimulates growth, innovation and trade.**

A balanced regulatory system delivers economic, social and environmental benefits whereas an unbalanced system may not achieve its intended outcomes, imposes unnecessary costs and can reduce the economy's adaptive capacity. Unbalanced regulation can deliver perverse outcomes such as delaying introduction of safer and better technologies to protect workers.

In the chemicals and plastics industry, regulation has been recognised as inconsistent, complex and costly, and this is causing businesses to reconsider investing in Australia.

## Guiding principles

'Good regulation' intends to set behaviours and standards that serve to meet the public and national interest.

Gary Banks, then Chairman of the Productivity Commission stated in 2003:

*"To be good, regulation must not only bring net benefits to society, it must also:*

- Be the most effective way of addressing an identified problem; and*
- Impose the least possible burden on those regulated and on the broader community."*

## Why this is important

The challenge for Australia is maintaining first world regulatory standards at a cost to government, industry and the community that facilitates:

- Access to chemicals for current needs and to deliver solutions to major challenges facing society including climate change, water shortage, population increases and resource constraints
- Innovation and competition
- Trade – both imports and exports of chemicals and products
- A skilled workforce and technology transfer to other sectors
- Security of supply through an active, integrated chemicals manufacturing sector
- Positive contribution to the economy and community.

## What's in place

The chemicals and plastics industry has a legacy of regulation that has evolved independently over a long period.

### The current Australian regulatory environment:

- Has endemic complexity that frustrates compliance
- Hampers the introduction of newer, better, safer chemicals, products and technologies
- Adds costs that do not contribute to benefits in public health, worker safety or the environment
- Makes Australian industry uncompetitive with major trading partners.

Despite a wide range of regulatory reviews since 1996, little meaningful reform progress has been made.

## Actions PACIA is calling for

### To achieve a balanced regulatory environment, governments need to:

- Be smarter in the design and implementation of chemical regulation to support innovation, investment and Australia's competitive advantage
- Focus on delivering outcomes rather than processes
- Facilitate innovation rather than frustrate it
- Ensure 'minimum effective regulation': the most effective way of addressing an identified problem, impose the least possible burden on those regulated and the broader community, and deliver a business operating environment that stimulates growth, innovation and trade.

### Industry's highest priorities are:

- Reforming the National Industrial Chemicals Notification and Assessment Scheme (NICNAS)
- Ensuring national regulatory consistency.

**The current Australian regulatory environment makes Australian industry uncompetitive with major trading partners**



## **PRIORITY: NICNAS REFORM**

### **The issues**

Commonwealth regulation of industrial chemicals is impeding the introduction of newer, better, safer chemicals, products and technologies.

This adversely impacts investment decision-making, innovation, productivity and potentially outcomes for public health, worker safety and the environment.

### **PACIA's position**

#### **Reform of NICNAS must focus on:**

- Establishing clear institutional roles and responsibilities for NICNAS and related policy and operational risk management departments and agencies
- Accepting outcomes of assessments from recognised overseas regulators (for example, European Union, Canada, United States)
- Fixing the system for consideration of chemicals of low regulatory concern to achieve appropriate risk-resource allocation and management.
- Delivering a regulatory environment that supports innovation, investment and competition.

## **PRIORITY: NATIONAL REGULATORY CONSISTENCY**

In February 2006, COAG identified chemicals and plastics as a 'hotspot' in the national reform agenda and established a ministerial taskforce to drive regulatory reform of the sector. This reform aimed to reduce the compliance burden while maintaining appropriate occupational health and safety, public health and environmental protection.

In July 2008, the Productivity Commission handed down a research report on chemicals and plastics regulation. In October that year, COAG agreed to implement regulation and competition reforms under the National Partnership Agreement to Deliver a Seamless National Economy. In May 2013, many regulatory reforms have not been achieved.

### **The issues**

- A disconnect between COAG-desired outcomes and delivery by departments and agencies at national and state/territory levels
- Increasing regulatory burden
- Regulatory complexity undermines compliance
- Regulatory inconsistencies impose unnecessary costs to industry and the economy.

### **PACIA's position**

- Meaningful regulatory reform will result in lower business costs and deliver a business operating environment that stimulates growth, innovation and trade
- Governments must use template/applied law (rather than model legislation) as the most effective and efficient way to deliver consistent outcomes
- Governments must ensure accountability and transparency of reform, and measure delivery
- COAG must recommit to chemicals and plastics regulatory reform to achieve a *Seamless National Economy*.

**Balanced regulation  
should protect  
workers, public health,  
the community and  
environment as well  
as stimulate growth,  
innovation and trade**



# Competitive Capital



**Capital is global and investors base return on investment decisions on the business case for each destination.**

**Australia needs to be an attractive investment destination if its chemicals and plastics industry is to be internationally competitive.**

This is becoming increasingly challenging as producers, especially in Asia and the Middle East, upgrade their manufacturing plants with world scale, cutting edge technologies.

## Why this is important

Manufacturing is a crucial part of a balanced and broad-based economy. It relies on a wide range of products supplied by the chemicals and plastics sector. As the second largest manufacturing sector, the chemicals and plastics industry is a major employer of highly skilled, highly paid and high-leveraging workers and is at the headwaters of most supply chains in the economy.

Investment in existing or new plant and equipment is required if the Australian industry is to achieve sustainable growth by taking up the opportunities identified in the Megatrends (see page 4). But it is no longer clear that Australia is an attractive place to invest.



## What's in place

Australia has several traditional competitive advantages as an investment destination: abundant natural resources for feedstock and energy; a skilled and capable workforce; good health, safety and environment performance; and stable financial and political systems.

Australia has the capability to attract global capital but in recent years, these traditional competitive advantages have been offset by a lack of access to gas at competitive prices, costly and complex regulation and other increasing business costs.

These and other investment barriers or roadblocks are preventing the industry from taking up opportunities to meet the burgeoning demand from Asia and developing countries.

## What needs to improve

The industry needs to make significant investment in plant and equipment to compete with more modern and larger plants, especially in Asia and the Middle East.

In order to be recognised as an attractive business and investment destination, the industry and governments need to make better use of what they have got – by working together to better leverage Australia's traditional competitive advantages (such as a highly skilled and capable workforce) to overcome its competitive disadvantages, and remove investment barriers or roadblocks including:

- Uncertainty about gas supply contracts and prices
- Burdensome and complex regulatory, environmental and planning approval processes

- The cost of doing business
- Complex and inconsistent policy settings at federal, state and local government levels (especially compared with other viable investment destinations)
- Uncertainty about the future of Australian manufacturing, including policy settings
- Insufficient access to R&D incentives.

## Actions PACIA is calling for

- Government to work with industry to remove identified investment barriers (roadblocks)
- Federal, state and local governments to factor in the unique and strategic capability and role of the chemicals and plastics sector in their investment and planning decisions
- Incentives from government such as accelerated depreciation to attract investment in plant, equipment and people, delivering a return on investment to companies and the community
- Government to support local producers to safeguard against identified internationally recognised unfair trading practices.

**Removing investment barriers can enable the industry to take up opportunities to meet demand from Asia and the developing countries**

# Social Licence to Operate



**A social licence to operate exists when an industry is respected and valued as an important and trusted part of the economy and community. It is therefore welcomed and supported by the local and broader community, governments and media.**

Approval and support of an industry is based on beliefs, perceptions and opinions of its performance, including the way it treats workers and neighbours, health, safety and environmental protection, corporate ethics, and its contribution to the economy and society. These perceptions can change with new information, so the social licence to operate has to be earned and maintained.

## Why this is important

Communities and other stakeholders are better able to accept and support the chemicals and plastics industry if they understand its crucial role in improving Australia's living standards and its work in protecting public and worker health and the environment. The industry can and does do this by building relationships and trust with communities, government and other stakeholders through open and transparent engagement, which strengthens its reputation as an important part of the economy and community, and as an innovative employer.



The industry's social licence to operate cannot be taken for granted and it must continue to improve its HSE performance and engage with communities, governments and media to build awareness of its importance in everyday life and its central role in developing solutions to global issues such as food security, healthcare and wellbeing, and climate change.

## What's in place

The industry has a long history of demonstrating leadership in meeting community concerns while improving industry performance, beginning with the global *Responsible Care*® program. This program drives continuous improvement in environmental performance, workplace health and safety, and product stewardship.

In 2008, PACIA developed the *Sustainability Leadership Framework*, which helps companies improve their performance in 11 priority areas including energy and greenhouse, water, community and stakeholders, and product management. The framework is designed to help companies respond, adapt and transform to remain successful, competitive and profitable.

The industry engages with communities around its plants through consultative groups, typically comprising representatives of companies, residents, local government and regulatory authorities. These groups ensure constructive dialogue on business activities and developments, HSE performance and provide opportunities for residents and industry to better understand each other's perspectives and concerns.

## What needs to improve

- Awareness of the industry's importance in everyday life, value to the community and work in developing solutions to global issues such as food security, health and wellbeing, and climate change.
- Government and community understanding of the industry's pivotal position in supply chains, and the economic disruption and cost of breaks in these chains (supply shocks).
- Shared learning within industry to build business value and give more weight to engagement with government and communities.
- Continued company improvements in HSE performance and community and workforce engagement.

## Actions PACIA is calling for

- Companies that work with chemicals and plastics to commit to the *PACIA Sustainability Leadership Framework* and *Responsible Care*® programs
- Targeted education, awareness and stakeholder engagement campaigns to increase understanding of the industry and improve recognition of its strategic value and reputation to attract young, skilled talent
- Government to ensure sound land use planning controls around chemicals and plastics plants to enable industry to operate effectively.

# Innovation and Strong Intellectual Property



Australia's chemicals and plastics industry has developed many highly innovative products and advanced manufacturing systems including polymer banknotes, smart packaging and round-bale silage systems.

Because of its pivotal position in the Australian economy, innovation and productivity improvements in the industry can deliver magnified benefits throughout supply chains.

Improved product formulations, process improvements such as flow chemistry and intensification, improved resource use, and efficiency through lightweighting and insulation are examples of increasing the competitiveness of downstream industries.

In order to meet the demands of growing markets globally and domestically, the chemicals and plastics industry and the downstream industries they enable, need to have a competitive advantage based on innovation of new materials and products and strong intellectual property protection.



An innovative chemicals and plastics industry can help create a more balanced and resilient economy

## Why this is important

Innovation and the ability to effectively protect intellectual property is a differentiator and competitive advantage. The chemicals and plastics industry is uniquely placed to help 109 Australian industries improve their own intellectual property position to customers and end consumers.

An innovative chemicals and plastics industry can help downstream industries adapt to change, helping to create a more balanced and resilient economy and take advantage of the opportunities identified in the Megatrends (see page 4).

## What's in place

- Existing collaboration in valuable and effective partnerships that match industry need and R&D capability including Cooperative Research Centres, Monash Green Chemical Futures, the Victorian Centre for Sustainable Chemicals Manufacturing and CSIRO partnerships
- Companies and sectors conduct their own foresighting and publish R&D priorities
- A strong R&D capability within governments, universities and the private sector
- Company-based R&D programs that help to deliver the outcomes of innovation
- Enforcement of intellectual property rights.

## What needs to improve

- Matching and coordination between government, industry and R&D agencies to enable companies to access grants and form collaborative partnerships to deliver better products

- Stronger intellectual property and knowledge base to enable industry to increase innovation in new products and processes
- Industry must make better use of R&D as a professional service to add business value and strengthen its innovation and intellectual property
- Industrial R&D must be outcome and business focused
- Sector-to-sector research that better uses chemistry to meet demands identified in the Megatrends (see page 4)

## Actions PACIA is calling for

- Align and match industry needs to R&D capacity to take advantage of opportunities described in the Megatrends (see page 4)
- Identify research, development and technology priority areas to enable efficient use of R&D resources and improve opportunities to attract collaboration in demand-driven R&D projects
- Focus on specific market-based technologies to improve Australia's competitive advantage in agriculture and food, mining, building and construction, materials recycling and healthcare and wellbeing
- Governments to take a national approach to address Australia's research capacity and facilitate industry outcome-focused R&D to improve national competitive advantage
- Deliver business value for industry-focused research clusters. Use these clusters to add value, stimulate new business ideas and help SMEs make better use of R&D services, including commercialisation.



# Strong Customer Base



**The Australian chemicals and plastics industry needs to continue developing products and the productive capacity to help customers along supply chains meet the demands of rapid population and economic growth in areas such as Asia, the Middle East and Latin America.**

Chemistry is a critical enabler for customers in key growth sectors including agriculture and food, mining, building and construction, water, materials recycling and healthcare and wellbeing.

Based on competitive advantages including abundant gas and energy, Australia could build a world-scale industry to service growing global and domestic markets.

In addition to new products, the industry can add further value by developing complementary and allied services.

**Australia could build a world-scale industry to service growing global and domestic markets**

## Why this is important

As demand grows, the Australian chemicals and plastics industry must be competitively positioned to take advantage of a growing customer base. This includes global-scale, leading technology plants to meet local and export demand.

Complementing products with high value-added services-based solutions can improve the overall business offering, including differentiation.

## What's in place

- Ongoing commercial market development for products and services
- Government assistance with market development through trade delegations to new market and technology areas and other support programs
- Industry networks such as international chambers of commerce and industry that provide opportunities for business development
- Export supply chain management.

## What needs to improve

- Engage industry in bilateral and multilateral trade negotiations
- Make better use of trade delegations and other market support opportunities on offer
- Complement company product offerings with services such as:
  - Occupational health and safety management
  - Environmental management
  - Software and computing systems for the chemicals and plastics industry

- Plant design, maintenance and operation
- Chemicals and plastics market and consumer research
- Increase the business value to customers by applying the principles and practices of whole-of lifecycle and supply chain sustainability
- Infrastructure needs to keep pace with business growth.

## Actions PACIA is calling for

- Government-sponsored market research and support to help industry adapt to change and respond to Megatrend opportunities
- Industry to make more effective use of trade delegations and other services designed to improve access to new markets
- Industry to identify and develop expertise-based service offerings to add value to products
- These offerings can be improved by adopting a life-cycle approach.



# Skilled and Productive Talent



**Delivering solutions to Australia's 109 industries requires the best skilled technical professionals and a diverse skill set to operate plant, drive productivity improvements and develop and support market expansion and diversity.**

## Why this is important

Accessing and retaining skilled and productive talent is essential if the Australian chemicals and plastics industry is to compete with lower-cost producers and take advantage of the opportunities identified in the Megatrends (see page 4). The Australian industry has to be smarter by identifying and leveraging competitive advantages that are ahead of the opportunities rather than behind.

Rising education and skill levels in India, China, Singapore, South Korea and other countries is increasing the competition for the best skilled technical workers, which can result in recruitment problems and add further costs.

If and when skilled jobs remain unfilled for long periods (that is, skills gaps), companies may delay or abandon investment or growth plans, stalling economic progress. Sometimes overqualified or imported labour may need to be hired to fill these gaps, leading to cost increases.

## What's in place

- Industry employment has been falling since 2002, as well as the number of companies
- Every job in chemistry creates about five along the supply chain
- Industry trains employees and provides professional development to apprentices, trades and technicians, plant operators, engineers and executives
- Governments provide a comprehensive range of education and skill support programs, opportunities and policy settings
- Industry engages with research agencies and academia to promote and attract graduates, including through doctoral research.

## What needs to improve

- Match future skill requirements with current and planned training priorities, including allowing for an ageing workforce
- Certainty about the industry's future (and manufacturing in Australia generally) to attract and retain young, skilled talent and replace an ageing workforce in coming years
- Timely and collaborative action by industry stakeholders to update the skills of existing workers to better equip them in a changing industry
- Training programs that equip young workers with the skills necessary for entry-level positions
- Employment flexibility that engages employees, recognises high performance, and draws on their skills and knowledge to improve productivity and agility in the workplace
- Collaboration with supply chains to deliver productivity improvements.

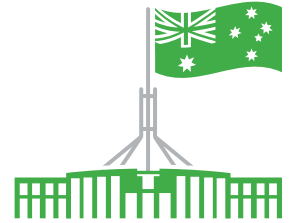
## Actions PACIA is calling for

- Industry needs to continually update the skills of its workforce to ensure it remains ahead of the changing market opportunities as identified in the Megatrends (see page 4)
- Industry, universities and government need to collaborate to attract, train and retain more highly skilled technical employees
- Develop an industry education, awareness and engagement campaign and deliver it to secondary and tertiary science students to attract young, skilled talent.

**Every job in chemistry creates about five along the supply chain**



# Stable Political and Financial Systems



**Australia has stable political and financial systems and essential services, such as the rule of law and national security.**

## Why this is important

This stability (or low sovereign risk) helps make Australia an attractive investment destination.

Industry recognises that the stability of political, financial and legal systems provides a solid foundation for investment in the chemicals and plastics industry.

It will be important for federal, state and local governments to build on this foundation to further improve Australia's competitive advantage. It will also be important for business to maintain and enhance corporate governance standards.

## What's in place

Australia is democratically and institutionally stable, and has transparent legal frameworks, a highly regulated banking system and effective enforcement of intellectual property rights.

## Actions PACIA is calling for

- Maintain the foundation that stable and financial systems provide for investment
- Maintain high corporate governance standards.



# Call to Action

**The chemicals and plastics industry vision is:**

**"A vibrant and sustainable industry in Australia, providing the building blocks of a modern economy and central to the country's economic, environmental and social wellbeing"**

**The industry welcomes the significant opportunities this roadmap presents for the industry to achieve its vision, and to add significant value to the Australian economy.**

The roadmap needs collaborative and coordinated actions to achieve the fundamental needs of a sustainable industry. These actions must be carried out strategically and cooperatively between industry and federal, state and local governments, along supply chains and in research agencies, workplaces and communities.

Change brings with it opportunity. The Megatrends (see page 4) set out the opportunities from major global and domestic changes, and this roadmap describes how the Australian chemicals and plastics sector can enable the nation's industry to take advantage of these changes.

**We look forward to working with leaders in governments, industries, trade unions, research organisations and academia, communities and other key stakeholders to ensure these opportunities are realised for future generations.**



## Fundamental Needs for a Sustainable Chemicals and Plastics Industry

- 1&2 Access to Natural Gas for Feedstock and Energy
- 3 Balanced Regulatory Environment
- 4 Competitive Capital
- 5 Social Licence to Operate
- 6 Innovation and Intellectual Property
- 7 Strong Customer Base
- 8 Skilled and Productive Talent
- 9 Stable Political and Financial Systems



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