

SEPTEMBER 2013

# WESTERN TRADE COAST INTEGRATED ASSESSMENT

ENVIRONMENTAL, SOCIAL AND ECONOMIC IMPACT

REISSUED SEPTEMBER 2014

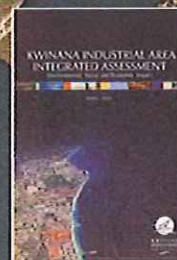
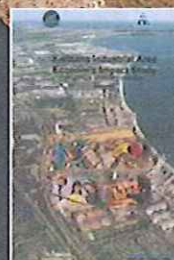
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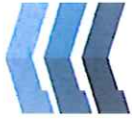
LATITUDE 32  
INDUSTRY ZONE

ROCKINGHAM  
INDUSTRY ZONE

SINCLAIR KNIGHT MERZ  
**SKM**  
**R.E.U.**  
Est. 1997\* Resource Economics Unit









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<p><b>Kwinana Industries Council</b></p> 	<p><b>AMC Connect</b></p> 
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The time and effort individuals and businesses put into completing surveys was critical to the successful completion of this study. These companies are recognised more fully in **Appendix A**.

We also wish to thank the various state and local government departments who provided input to and review of the content developed.

This is an independent study. Unless otherwise stated, all opinions and values represent what was communicated to SKM and REU during engagement of both industry and government agencies.

This assessment seeks to identify issues and opportunities as raised by survey respondents and interviewees and to prioritise their importance to the WTC. It does not consider Agency activities that may be underway or planned to address these matters.

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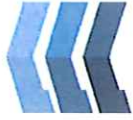
## Abstract

This report on the Western Trade Coast (WTC) was commissioned by the WTC Industries Committee and prepared by Sinclair Knight Merz (SKM) and Resource Economics Unit (REU). It is the fourth report of its kind, with previous reports published in 1990, 2002 and 2007.

The report presents and reviews environmental, social and economic performance data of WTC industries, sourced directly from these industries and supplemented by state and local government data and other published reports. Both qualitative and quantitative data were collected, with 40 interviews conducted and 27 questionnaire responses analysed.

The following key findings reinforce that the WTC is the State's premier industrial area, and has evolved a unique level of connectivity that gives strategic advantages to industry located within the WTC as well as Western Australia in general. The WTC: -

- 1) **Is a significant contributor to the Western Australian economy with direct sales of \$14.7 billion per annum.**
- 2) **Employs 11,362 people directly, of which 64% live locally within Cockburn, Kwinana or Rockingham.**
- 3) **Pays \$953 million in wages and salaries directly to workers employed within the WTC.**
- 4) **Has indirect inter-industry flow-on effects amounting to an estimated \$10.3 billion in output, \$0.8 billion in wages and salaries paid, and 18,274 jobs.**
- 5) **Makes a positive social contribution to local communities with over \$1.8 million dollars in donations reported by industries participating in the study for 2010/11, over double the value reported in 2007, in addition to the high level of local employment.**
- 6) **Has an extensive and highly integrated network of industrial symbiosis with approximately 158 synergies mapped between Kwinana cluster industries within the WTC, making the WTC a global leader in this area.**
- 7) **Has some protection from urban encroachment, though pressure does exist on the buffer, requiring further planning controls to protect both the community and industry.**
- 8) **Is a skills development centre and provides the state with a uniquely skilled workforce. The skills developed by WTC industries makes the local workforce highly valued by resource industries in the north.**
- 9) **Is committed to managing the environmental impacts of industry. Environmental issues including noise, air quality, societal risk, groundwater and the marine environment of Cockburn Sound are being well managed by industry and government, and have continued to improve over time.**



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## Executive Summary

The Western Trade Coast Industries Committee commissioned Sinclair Knight Merz (SKM) to perform an environmental, social and economic impact assessment of the Western Trade Coast (WTC). This study is the fourth snapshot in time, with the original study in 1990 by Dames and Moore, and subsequent studies undertaken in 2002 and 2007 by SKM and Resource Economics Unit (REU).

This iteration of the study has been expanded beyond its previous boundary of the Kwinana Industrial Area (KIA) and the Rockingham Industry Zone (RIZ) to encompass the entire WTC area, including areas such as the Australian Marine Complex (AMC) and the Latitude 32 Industry Zone. The current study seeks to address the following objectives:

- To quantify the direct and indirect economic and social importance of WTC industries to the local, Western Australian and Australian communities.
- To identify community benefits, environmental performance and sustainability initiatives of industry in the WTC.
- To determine the current synergies between WTC industries and report potential new synergies between industries.
- To identify the need for government support for existing industry and to facilitate establishment of new industries.

This study was based on the collection and analysis of qualitative and quantitative data obtained from existing and proposed WTC industries, support industries, government agencies and local government authorities.

The study has found that the WTC:

- Has a major impact on the Western Australian economy through employment and upskilling of workers, direct sales, and value adding to primary outputs.
- Directly produces a larger amount of income than the wages and salaries of their employees through payments of dividends, taxes and royalties.
- Has significant inter-industry flow-on effects.
- Has a strong positive contribution to the local community by providing employment, training and development, as well as sponsorship of community activities.
- Continues to improve environmental performance and advance sustainability initiatives which benefit the local and broader community.

One of the questions asked of industry in the questionnaire and during interviews was to identify the main constraints and benefits to their operations being located within the WTC. Industry response is presented graphically in Figure ES-1.

The available synergies, strategic location of the WTC adjacent to port facilities, protection of a buffer zone, and availability of process inputs are key attractive factors for WTC industries.

Urban encroachment is shown as a significant negative factor, along with energy costs, labour costs, level of environmental regulation and the value of the Australian dollar.

The future prosperity of the WTC should be protected by enhancing the positive attributes identified and addressing the issues of most concern to industry and other stakeholders in the region.

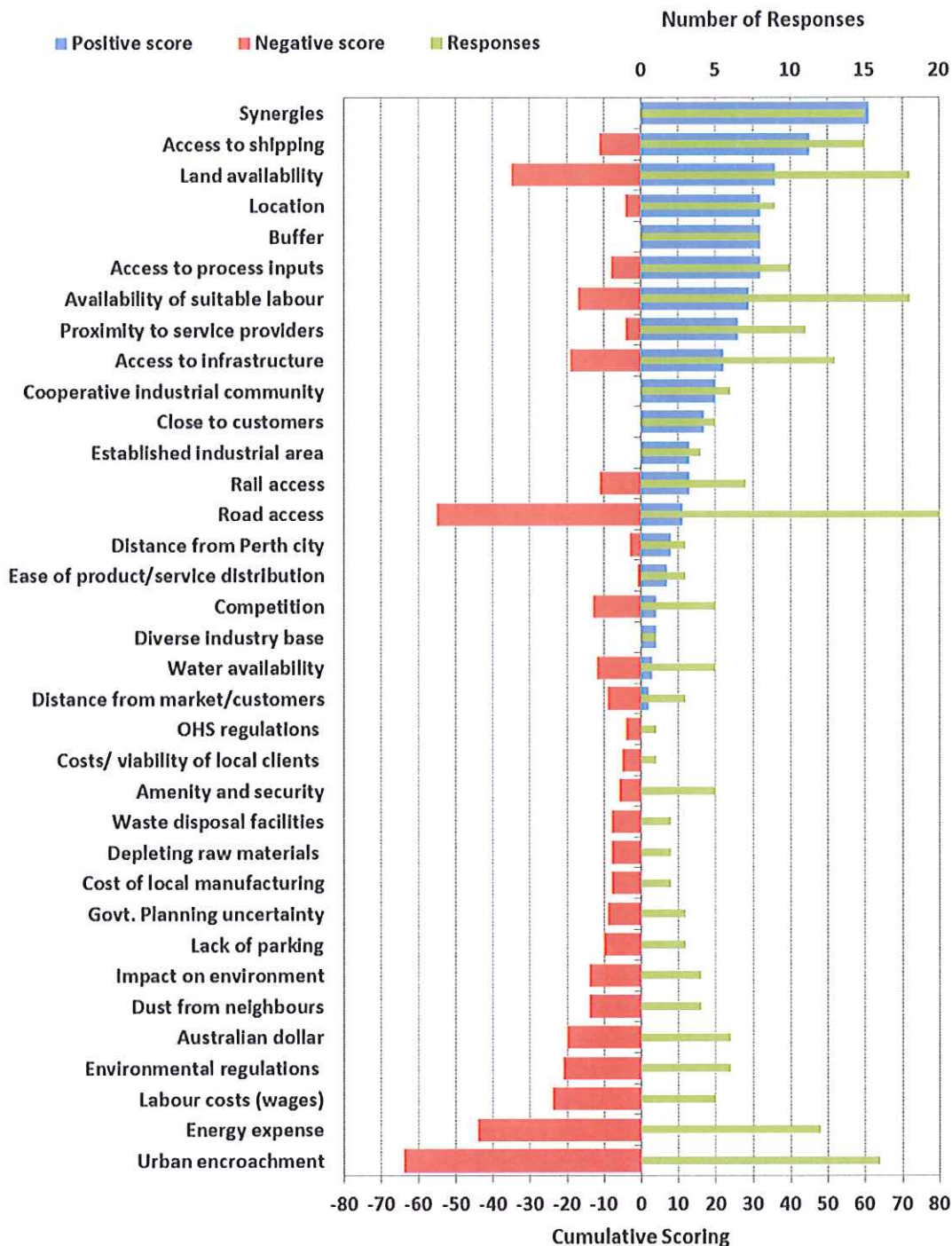


Figure ES-1 Key benefits and constraints of the WTC identified by industry





### Cumulative Synergies in the WTC

The WTC is geographically isolated from other major industrial centres and the major resource regions of WA. This isolation has allowed the area to evolve a unique connectivity of heavy, fabrication, support and service industries, with utilities and infrastructure to suit. A cooperative and amicable industrial community has also developed in tandem with the growing synergies of the WTC.

The growth of interacting industries and material transfers since the original 1990 study is presented in Table ES-1.

**Table ES-1 Trends in WTC (Kwinana cluster) synergies between 1990 and 2013**

	1990	2002	2007	2013
Participating Industries	13	28	31	27
Existing Interactions	27	106	145	158
New Interactions Identified	-	79	39	13
Interactions No Longer Existing	Not Studied	Not Studied	Not Studied	11
Potential Interactions	2	104	86	4

The number of synergies that have evolved in the WTC represent a significant feature of the region, with 158 interactions identified in the course of this study. For comparison, the Kalundborg Eco-Industrial Estate in Denmark, held as a global example of industrial symbiosis, has just 30 reported industrial synergies.

Investigation of industrial synergies in the WTC has found that:

- Geographical isolation has been a major factor in the development of industrial synergies and a connected industrial community in the WTC.
- Industrial symbiosis in the WTC has been well established since the original 1990 study and has continued to mature through into 2013.
- The WTC has an opportunity to raise its international profile by more widely emphasising its significant existing industrial symbiosis credentials, and the potential opportunities that exist for new industries to leverage this.

### Environmental Performance of the WTC

The environmental performance of WTC industries can be summarised as follows:

- Environmental aspects including noise, air quality, societal risk, groundwater and the marine environment of Cockburn Sound are being well managed by industry and government.
- ISO 14001 accreditation levels in the WTC have increased since 2007, particularly so for KIA industries.
- WTC industry are leveraging industrial symbiosis to avoid unnecessary environmental impacts that would occur if they operated in isolation.
- WTC industries are continuing to make incremental capital improvements and operational changes that improve their efficiency and reduce environmental and community impacts.

Industry reported that environmental management systems (EMS), licence conditions and community expectations are the main drivers for improving their environmental performance. Industry also flagged that regulatory requirements for monitoring and reporting were becoming excessive, tying up resources they would rather be spending on environmental improvement initiatives.



## Social Benefits of the WTC

Survey data provided by WTC industries show the following social trends:

### *Employment*

- While the WTC workforce is still male dominated, gender representation has continued to improve in 2013 from 2007 and 2002, primarily in professional, trades, production and transport roles.
- The average age of the WTC workforce is continuing to increase.
- The WTC workforce is increasingly being sourced from suburbs and areas outside the traditional catchment zone of Cockburn, Rockingham and Kwinana.

The highest proportion of the current full-time workforce (excluding contractors) is employed in production and transport (35%), which comprise typically semi-skilled jobs, closely followed by tradespeople (28%). There is a demonstrated gradual increase over time in the proportion of female employees with the reported number of female tradespeople, production and transport, and professional roles showing continual, albeit small, growth.

The key factors affecting future levels of employment reported by industry were production limitations, capital investment in the region and the cost of labour. The drain of trained workers from the WTC to resource projects in the north was identified as an ongoing concern by industry as it reduced the pool of suitable workers to pick up specialised roles as required.

### *Services and Social Initiatives*

- Private, non-carpool vehicle use has increased in the WTC since 2007. At the same time, bicycle use is also showing signs of increase.
- WTC industries provide a variety of positive social services to their workforce and families, with a greater proportion of industries reported providing these services since 2007.
- WTC industries contributed over \$1.8 million dollars to the local community in the 2010/11 financial year, over double the donations reported in 2004/05 for the 2007 study.

A large proportion of industries in the WTC provide a range of health and personal services to their employees. The value of personal counselling and vaccinations to staff was clearly acknowledged with nearly all respondents indicating they did one or both. There was an increase in the provision of financial planning services and career planning from previous study years, which may be a reflection of the growing economic uncertainty reported by industry during interviews, and the response by industry to improve employee retention.

Most industry also provide basic assistance to employees with families, such as leave to care for sick members of family and bereavement leave (93%). A high proportion of respondents also provide options for paternity leave (86%). All respondents indicated that they provide flexible working hours for employees (100%). There is a noted increase over the years towards offering staff flexible working hours, increasing from 50% in 2002 to 100% at the time of this study.

Industries reported engagement with the community using a variety of methods, such as industry forums, media releases, open days, community reference groups and dedicated community liaison staff. There was no clearly preferred community engagement pathway identified across all industry participants.





### Direct Economic Benefits of the WTC

WTC industries have a significant impact on the local, state and national economies. The economic study undertaken for this report has calculated that:

- WTC core industries directly make sales of \$14.7 billion; provide 11,362 jobs; and pay \$953M in wages and salaries.
- The Kwinana Cluster remains the largest industrial cluster in the State.
- The Kwinana Cluster of industries accounts for approximately 70-90% of the WTC total sales, jobs, and wages and salaries figures (88% of sales – \$13.8 billion, 68% of jobs – 9,361 jobs, 69% of wages and salaries – \$0.7 billion).
- The output from the Kwinana Cluster of industries has grown by nearly 10% since the 2007 study. The proportion of output destined for overseas markets has declined in the Kwinana cluster. Conversely, the proportion of output in the Kwinana cluster serving the domestic Western Australian market has grown.
- The overall contribution of Kwinana Cluster of industries to the Australian Balance of Trade is estimated to be worth \$5,195 million. This may be compared to the total international export of goods and services from WA of \$118,000 million in 2010-11.
- The AMC Cluster of industries accounts for \$1.8 billion in sales, 4,396 jobs, and \$0.3 billion in wages and salaries in the WTC.

The key direct impacts of WTC industries are summarised in Table ES-2. Due to the small number of industries in Latitude 32 Industry Zone and RIZ compared to those in the KIA and AMC, industries are divided into two clusters, with Latitude 32 Industry Zone and RIZ industries combined with KIA in the 'Kwinana Cluster'. "Core" activities are defined as the leading industries in each cluster, whereas "Non-core" activities are manufacturing or service industries whose existence is due only partly to the presence of the Core activities, and which also serve the wider Perth and Western Australian economy.

**Table ES-2 Estimated output (sales), wages and salaries and employment of producers located within the WTC boundary in 2010-11 FY**

	AMC		Kwinana Cluster		WTC Total	
	All Industries	Core Only	All Industries	Core Only	All Industries	Core Only
Employment	4,396	3,655	9,361	7,707	13,757	11,362
Estimated Output (sales) (\$M)	1,811	1,562	13,753	13,103	15,563	14,664
Wages and Salaries (\$M)	335	282	733	671	1,068	953

In addition to the direct operating impacts, shown above, responding organisations reported CAPEX of \$545 million in 2010-11. The true total investment would be significantly larger.

### Inter-industry flow-on effects of the WTC

Inter-industry flow-on effects are the levels of output, wages, salaries and jobs that are generated in other industries by the purchase of inputs by WTC industries, and the subsequent flow-on effects of the purchases that the suppliers make. These inter-industry flow-on effects were calculated using a new input-output table for Western Australia for 2010-11. As shown in Table ES-3 it is estimated that:

- WTC industries, through operations and capital expenditure in 2010-11, generated *inter-industry* flow-on effects in WA and the rest of Australia amounting to \$10.3 billion, wages and salaries of \$0.8 billion and estimated employment amounting to a further 18,274 jobs.





Table ES-3 Estimated inter-industry flow-on effects of the Western Trade Coast in 2010-11 FY

Inter-industry Effect	Output	Wages and Salaries	Employment
	(\$M)	(\$M)	(jobs)
Inter-industry effect in WA	9,586	659	16,587
Inter-industry effect in the Rest of Australia	258	17	448
Inter-industry effect of capital expenditure	441	92	1,239
<b>Total Inter-industry effect</b>	<b>10,285</b>	<b>768</b>	<b>18,274</b>

The inter-industry flow-on effects, in the table above, exclude the further effects of consumption-generated output, wages and salaries and jobs, when incomes earned either (i) directly in the WTC or (ii) in industries whose output is affected by flow-on effects, are spent by wage and salary earners. Appendix E discusses the potential consumption effect.

#### Comparative Economic Advantage

A recurring theme throughout this study is the paradox of (i) unprecedented growth in the Western Australian economy as a whole, and (ii) the challenges faced by the manufacturing sector. The paradox comes from the interactions between macro-economic development driven by growth of the resources sector in Western Australia and the micro-economic realities faced by manufacturers following from (i) changed price and availability of domestically-sourced inputs and (ii) the difficulty of living with a historically high Australian dollar for exporters. It was beyond the scope of this assessment to model these interactions, but they are real and plain to see.

- WTC managers view locational factors, including the availability of suitable infrastructure, inter-firm synergies, port facilities, raw material supply and market access as positive factors in their comparative advantage.
- Negative factors putting WTC industries at a disadvantage tended to focus on cost and availability of labour and production inputs, and the increasing costs of compliance with environmental regulations.
- Market demand and exchange rates are key sources of industry uncertainty, although there were many other factors across the board.
- Responding companies will be spending \$1,710 million to further develop existing plants over the next five years.
- No responding company expects production volumes to decrease in future, and there is potential for the WTC to double in output in response to the growth of Western Australia.
- The sustained performance of the Kwinana Cluster and the adaptability of the AMC Cluster are testimony to the contribution both areas make to a diversified Western Australian economy, providing a buffer whenever the rate of expansion of the resources sector slows.
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In order for the Western Trade Coast to compete on the international scene, it will need to minimise those factors which constrain industry and maximise the opportunities provided by our comparative advantage.



## Sustainability Assessment

As part of this study, industries were assessed on the way in which their organisations have integrated sustainability into their operations. The role that sustainability plays in the operations of WTC industries is summarised below:

- Sustainability is a real concept for all industries participating in the study, although for 33% of industries this is limited to a business sense.
- More than half of participating industries approach sustainability by initiating organisational and management change and by incorporating sustainability assessment into decision-making processes.
- Sustainability is increasing in importance to WTC businesses, with a notable increase in personnel dedicated to managing sustainability reported for 2013.
- The WTC needs to investigate renewables and other greenhouse gas reducing strategies to improve the sustainability of the region, and be prepared to adapt to any potential sustainability regulation in the future.
- More than half of WTC industries have greenhouse gas emission targets and/or strategies to reduce emissions.
- Resource depletion, water scarcity and carbon constraints are of reasonable concern to WTC industry, though lower than reported in 2007.

Many companies in the WTC have a sound understanding of sustainable development principles, have set targets and strategies to reach them and have assigned responsibility for their company's direction in sustainability to high-level management. Many of the larger companies in the WTC have a strong environmental and social performance and have incorporated sustainability principles into their corporate structure. Some of the smaller companies have also performed well, but could benefit from the experiences and knowledge of the larger companies being transferred to them.

## Integrated Assessment

Figure ES-2 shows the environmental, social, economic and corporate sustainable performance of WTC industries. Social and environmental performance data provided by industry was quantified to produce the x and y scales (see Appendix G for further detail). The level of success with which industries have incorporated sustainability into the structure of their organisation has also been quantified and is represented by the colour of each industry's diamond marker. The size of each marker represents the total economic value of that industry to the Australian economy.

Engagement with industry and government stakeholders identified a number of desirable actions that would enhance the environmental, social and economic outcomes of the WTC. These are summarised by issue in Table ES-4.



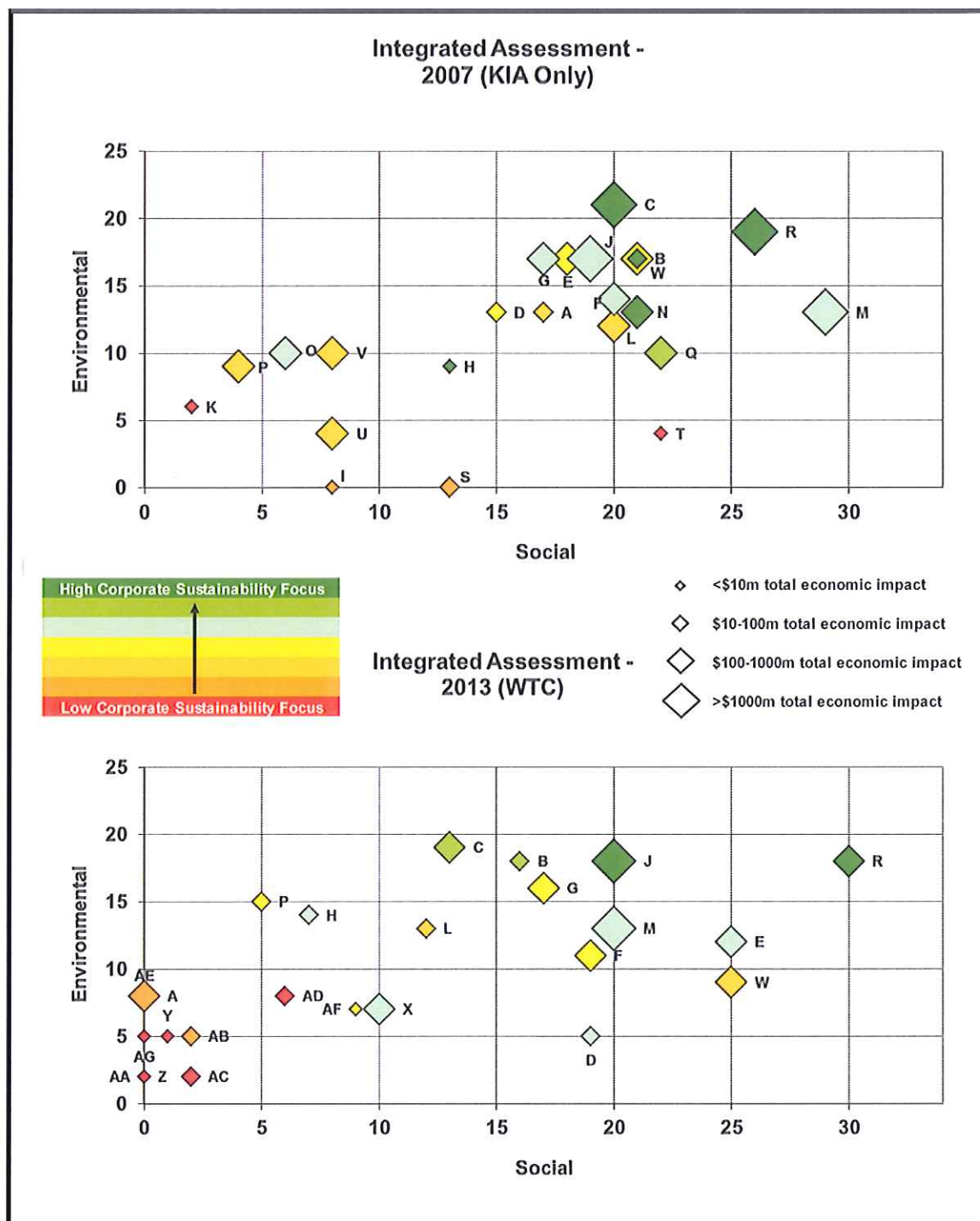


Figure ES-2 Integrated assessment of environmental, social, economic and corporate sustainability measures implemented by WTC industries in 2007 and in 2013





Table ES-4 Summary of WTC priorities

	Proposed strategies	Priority
Port Infrastructure	Government to make decision on port development/s and timeframes for the port and infrastructure linkages, including deepening of shipping channels as required by industry	H
	Investigate and engage with industry on the impact of a new port on water temperature and water quality, and the subsequent impacts on ocean intake and outfall requirements of industry	M
Buffer Zone	Stabilise the buffer zone by defining and enforcing the buffer zone boundary	H
	Manage urban encroachment to reduce risk of community impact	H
	Secure long-term storage option within or near the WTC for hazardous materials	H
Energy Cost and Capacity	Investigate ways to reduce unit cost of gas and improve availability of supply	H
	Investigate ways to reduce unit cost of electricity for industry	M
	Explore renewable energy supplies as an alternative to gas and electricity	L
Water Supply	Investigate the potential of Managed Aquifer Recharge (MAR)	H
	Investigate more extensive utilisation of Sepia Depression Ocean Outlet Line as a low-cost water supply for individual industries to treat to their own required standards	H
	Facilitate sharing information regarding current groundwater resources and industry usage	M
Road and Rail Infrastructure	Ensure no sensitive land-uses are established around existing and proposed infrastructure links to protect haulage road and rail links into the WTC	H
	Address road and rail infrastructure perceived safety concerns that have been highlighted at some locations in the WTC – see Figure 3-1	H
	Upgrade road and rail infrastructure in the area to facilitate improved traffic flow – see Figure 3-1	H
	Coordinate communication and cross-industry cooperation between industries to manage known traffic issues	M
	Investigate making public transport to and from the WTC more attractive and easier to use as part of any road and rail infrastructure upgrade	M



Human Resources and Procurement	Investigate or support initiatives looking to address wage and opportunity disparities between resource industries in WA's north and WTC industries	H
	Investigate opportunities or policies that make it easier for smaller industries to retain experienced staff or reduce the cost to develop new staff	H
	Establish a local industry procurement framework to promote local small businesses to major WTC industry, and collective purchasing arrangements to make procurement of locally produced materials more economical	M
	Investigate opportunities to coordinate shut-down and maintenance timing across all industry to reduce costs and improve reliability of workforce procured	M
	Roll-out a KIA-wide level safety induction included in industry baseline safety standards	L
	Review Dangerous Goods legislation to make employment of apprentices under 18 possible to heavy industry	L
	Encourage development of more local amenities (banks, dining, cafes, etc.) to promote the WTC as an attractive and vibrant place to work	L
Land Use, Management and Availability	Address industry perceptions around the commercial aspects of land-leasing arrangements in the WTC	H
	Investigate relocation of non-conforming land-uses to reduce societal risk	H
	Develop and publish detailed land-use plans for the WTC area	M
	Explore ways to improve the wider security of operations and management of crime in the area	M
	Centralise and maintain database of KIA pipeline ownership	L
Environmental Performance	Review and reconcile the required level of environmental regulation and compliance reporting for heavy industry	H
	Improve community engagement and knowledge about the value of WTC industries, and their environmental and social performance	H
	Manage any potential increase in shipping traffic from the development of port facilities and associated impacts	H
	Install communal car-wash facilities at various points within the KIA	L
	Continue to reduce visual amenity impacts using methods such as green landscaping as a means of buffering residents and non-local traffic from visual impacts	L
Economic Climate	Maintain a close relationship with WTC industries to ensure government understands impacts of world economy on WTC industries	H
	Investigate opportunities to encourage new investment in value-adding processes and activities	M



AMC Land Availability and Waterfront Access	Investigate options and develop additional land for AMC expansion over the short, medium and longer terms	H
	Examine options and develop a plan for expansion of waterfront laydown area in consultation with stakeholders	H
	Investigate carpark solutions	M
	Streamline the process for prospective industry to acquire land for development	M
AMC Infrastructure, Utilities and Transport	Upgrade traffic and freight infrastructure to resolve accessibility issues	H
	Accelerate development of infrastructure in new land developments in WTC	M
	Investigate ways to reduce unit cost of electricity for industry	M
	Explore renewable energy supplies as an alternative to gas and electricity	L
AMC Human Resources	Foster the image of AMC as a vibrant and exciting place to be employed	M
	Pursue opportunities to develop and advertise the AMC as a knowledge hub and technical leader for supporting resource industries	M
AMC Miscellaneous	Work with industry to develop a guideline and environmental management framework for small to medium level enterprises	M
	Liaise with the Australian Competition and Consumer Commission on anti-dumping law enforcement	M
Latitude 32 Industry Zone Land Development and Planning	Secure funding to complete land acquisition, potentially through a contribution scheme	H
	Strengthen and enforce planning regulations to facilitate coordinated development	H
	Balance extraction of strategic resource deposits with final cut and level plans for the Latitude 32 Industry Zone	H
	Increase security to reduce vandalism and crime in the area	M
Latitude 32 Industry Zone Infrastructure, Utilities and Transport	Plan suitable buffers around existing and planned infrastructure links to protect against urban encroachment	H
	Improve service infrastructure to support future industrial development	M
	Encourage development of overnight truck parking facilities to accommodate WTC industries with large truck operations	M





## Document history and status

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Rev 0	15/04/2013	L. Jones	L. Jones	15/04/2013	Economic methodology and technical appendix review
Rev 1	03/05/2013	L. Jones	L. Jones	03/05/2013	Economic technical content
Rev 2	17/05/2013	L. Jones	L. Jones	17/05/2013	Economic technical content
Rev 3	17/05/2013	L. Jones	L. Jones	21/05/2013	Draft report for workshop session
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Appendix A. Participating Industries

Appendix B. Study Limitation and Methodology Scope

Appendix C. Global Case Studies

Appendix D. Demographic Analysis

Appendix E. Economic Impact Assessment Methodology

Appendix F. Process for Improving Integration and Sustainable Development

Appendix G. Integrated Assessment Methodology