
NATION BUILDING:

LEVERAGING AUSTRALIAN AND KOREAN, ENGINEERING,
PROCUREMENT & CONSTRUCTION EXPERTISE



AUSTRALIA - KOREA
BUSINESS COUNCIL

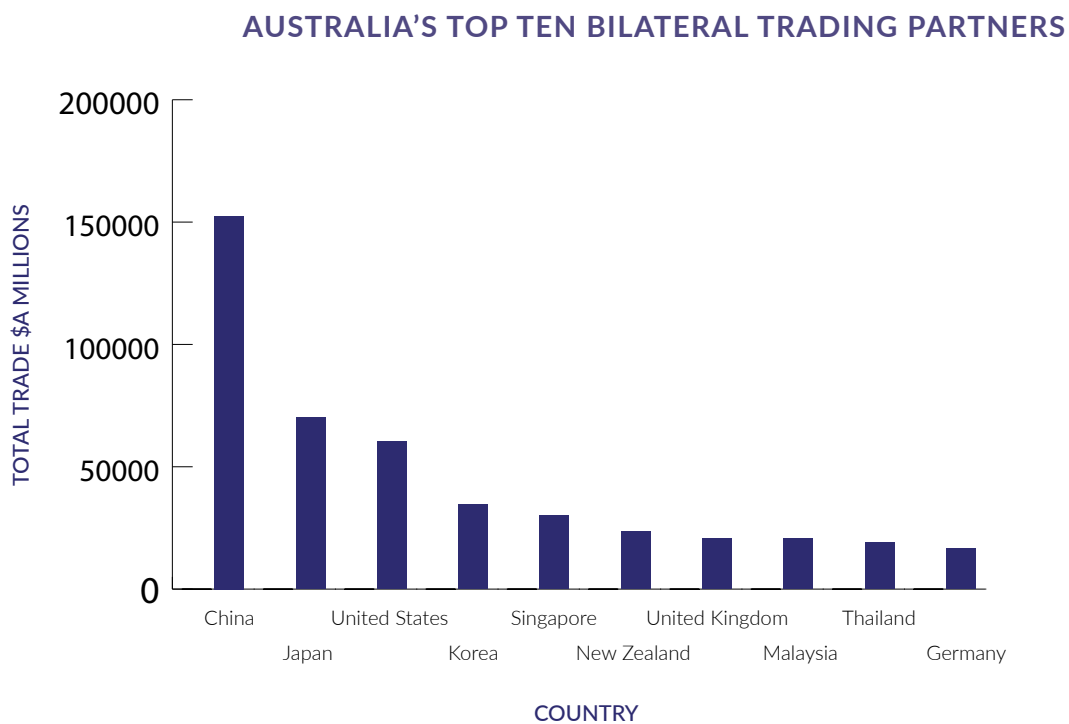


1. INTRODUCTION

Korea, the world's 11th largest economy¹ and Australia's fourth largest trading partner², relies on Australian natural resources for its manufacturing industries and energy production. Australia and Korea's relationship has been built on the energy and resource trade with the top exports to Korea from Australia being LNG, iron ore and coal. POSCO, a Korean conglomerate, is Australia's largest individual customer, with diverse interests in Australian iron ore, coal and infrastructure assets, and an increasing presence in the construction sector focusing on major capital projects³.

Korean companies have sought to leverage the strong Australian trade relationship, and evaluate vertical integration opportunities in Australia. This has been made possible by Korean ownership (full and partial) of Australian energy and resource projects, and participation in the development of these projects and other economic infrastructure projects. This has led to Korean companies having successfully imported their Engineering, Procurement and Construction (EPC) expertise and financial capacity. The trade opportunities between Australia and Korea have also been strengthened and enhanced following the signing of the Korea Australia Free Trade Agreement (KAFTA) in 2014.

Figure 1: Australia's top ten two-way trading partners



Source: Department of Foreign Affairs and Trade, 2016

This report provides an overview of the Australian infrastructure market, and highlights Korean capabilities to deliver and provide funding to major infrastructure, energy and resource projects in Australia, and in offshore markets.

1 (The World Bank, 2017)

2 (Department of Foreign Affairs and Trade a, 2016)

3 (Department of Foreign Affairs and Trade a, 2016)

2. NEW INFRASTRUCTURE REQUIRED FOR AUSTRALIA’S FUTURE PROSPERITY

Australia has ‘grown and transformed in recent decades’⁴ and this trend is forecast to continue, as outlined in the Australian Infrastructure Audit⁵ and Australian Infrastructure Plan⁶. Infrastructure Australia have reported that productive infrastructure investment is essential to drive economic growth, increase employment and enhance the quality of life for all Australians⁷. This has led to a combined commitment in expenditure from both the public and private sector of more than ‘\$A50 billion for both current and future infrastructure investment’⁸. Following the release of the Australian Federal Government 2017 Budget (2017 Budget) a further \$A75 billion over ten years has been committed towards infrastructure, with an additional \$A20 billion ‘once in a generation’ commitment also included, so as to ‘provide better connections for our cities and regions, to create new opportunities’⁹. The 2017 Budget, which sought to be a nation building budget, will present a significant opportunity for the construction sector and EPC companies within, particularly in the construction of road and rail projects.

To meet the increased demand for infrastructure over the next decade, the Australian Government is also seeking to attract further investment from the private sector, both domestically and internationally¹⁰. The Australian Trade Commission (Austrade) is tasked with promoting, attracting, facilitating and retaining foreign direct investment in Australian infrastructure, which will help fill the gaps in Australia’s infrastructure capability and increase competition¹¹. Further, the new Infrastructure and Project Financing Agency which will be integrated into the Department of Prime Minister and Cabinet, will advise the Australian Government on innovative approaches to the funding and financing of nationally significant infrastructure across all sectors, including transport, energy and water¹². The Government has developed a set of priorities, outlined below, for infrastructure investment aimed at ensuring a platform for Australia’s future growth and position within the global economy:

- Strengthens our global role as an exporter of resources, services and products, with improved networks and gateways that boost connectivity;
- Meets our needs as a highly urbanised nation, enhancing the liveability of our cities and fostering the skilled jobs and innovative businesses that cities create; and
- Underpins our prospects for sustainable growth, by focusing on resilience and whole-of-life asset management.

3. KOREAN INFRASTRUCTURE INVESTORS AND EPC FINANCIAL CAPABILITY

With many Korean’s ‘looking for increased financial security from their personal investments’¹³, institutional investors are considering high return ‘alternative products such as offshore investments (particularly in infrastructure and real estate), and partnerships with foreign financial services firms’¹⁴. This trend is supported by the Asia Region Funds Passport (the Passport) due to be released in late 2017¹⁵ of which Korea and Australia are members. The Passport facilitates the ‘crossborder offering of eligible collective investment schemes’¹⁶.

In April 2017, Korean and Australian asset managers met with members of the Korean Financial Investment Association (KOFIA) seeking to ‘review the current status of the Australian asset management market and explore potential investment opportunities’¹⁷. Korea’s National Pension Service (NPS), the fourth largest sovereign fund globally, is one such fund that anticipates ‘lifting its total offshore investments by \$US159 billion to \$US237 billion over the next five years’¹⁸. Other pension and insurance companies have since followed suit¹⁹.

4 (Infrastructure Australia, 2015, p. 2)

5 (2015)

6 (2016)

7 (Infrastructure Australia, 2015)

8 (Australian Trade and Investment Commission, 2016, p. 5)

9 (Minister for Infrastructure and Transport, 2017)

10 (Department of Infrastructure and Regional Development, 2017)

11 (Australian Trade and Investment Commission, 2017)

12 (Infrastructure and Project Financing Agenda, 2017)

13 (Austrade, 2014, p. 4)

14 (Austrade, 2014, p. 4)

15 (Austrade, 2014, p. 4)

16 (Austrade, 2014, p. 4)

17 (Financial Services Council, 2017)

18 (Financial Services Council, 2017)

19 (Mirae Asset Financial (investment manager), Korea Investment Corporation (sovereign wealth fund) and Korea Post (state-owned investor))

In May 2016, the Queensland Government signed a Memorandum of Understanding (MoU) with the Korean Development Bank (KDB), which was cited by the Queensland Government as assisting in the unlocking of 'significant investment opportunities across Queensland including in infrastructure, energy and natural resources'²⁰. As such, the Australian Government's infrastructure strategy provides an opportunity for Korean investors and EPC expertise to fill gaps in Australia's infrastructure capability and funding needs. This follows the KDB's participation in the financing of the Port Botany and Port Kembla acquisition, and a \$A215 million investment in the first two stages of Sydney's WestConnex motorway²¹. KDB's investments on WestConnex have supported Korean engineering and construction group Samsung C&T's participation in the delivery of M4 East and the M5 stages of WestConnex²².

Table 1 below includes selected Korean fund activity and investment within Australia since 2011. With only 3.4 per cent of the \$A2.7 trillion in funds under management within Australia from international sources, there is huge potential for the Australian financial services sector to grow by managing Asia's wealth²³.

Table 1: Korean Fund Activity and Investments in Australia (since 2011, selective)

FUND NAME	TYPE	YEAR	AMOUNT	INVESTMENT
Samsung Asset Management	Asset manager	2017	\$US480m	JV with Melbourne based IFM Investors to raise US\$480m private equity fund to invest in infrastructure globally
Korea Zinc Company (Sun Metals Corporation)	Metal smelting	2017	\$A182m	Solar farm - QLD
Mirae Asset Global Investments	Investment management firm (Private)	2017	\$A300m	50 Marcus Clarke Street - ACT
		2013	\$A340m	Four Seasons - NSW
LaSalle Investment Management	Real estate funds manager	2017	\$A95m	Post Office Square - QLD
		2011	\$A19m	Bought out Trinity Funds Management
SK - Teacher's Pension Fund	Pension fund	2016	\$A206m	Green Square office tower - QLD
Korean Consortium	Institutional funds	2016	\$A336m	Woolworth's headquarters - NSW
Korean Investment Partners	Private equity	2016	\$A13m	Series B financing Aus Biotech Elastagen Pty Ltd
FG Asset Management	Investment management firm	2016	\$A225m	Louisa Lawson Building - ACT
			\$A112.9m	Red Cross - NSW
		2015	\$A64.8m	ATO Building - ACT
			\$A165m	ATO Building - VIC

20 (Queensland Government, 2016)

21 (Financial Review, 2017)

22 (Financial Review, 2017)

23 (Financial Services Council, 2017)

FUND NAME	TYPE	YEAR	AMOUNT	INVESTMENT
Korean Development Bank	State owned	2016	\$A150m \$A65m	Stage 1 WestConnex Stage 2 WestConnex Expressed an interest to fund the third Stage of WestConnex - NSW
		2013	\$A5,007m	In a consortium with 10 others Port Kembla & Port Botany- NSW
Hanwha Corporation	Multiple enterprises	2015	\$US33m	Acquired LDE Corporation Australia (Mining services) - QLD
National Pension Service	public pension fund	2013	\$A800m	Erina Fair Shopping Centre- NSW
		2010	\$A685m	Aurora Place office tower - NSW
Korea Investment Corporation	Sovereign pension fund	2012	\$A200m	Investment in a QIC wholesale property fund - QLD
POSCO	Steel producer	2013	\$A9.74m	Hume Coal Project sole owner, following acquisition of Cockatoo Coal's 30% share in the Project
		2012	\$A1,250m	Roy Hill - WA

Source: Published articles circa 2009-2017

4. A CLOSER LOOK AT THE AUSTRALIAN CONSTRUCTION INDUSTRY, AND IDENTIFICATION OF KOREAN AND AUSTRALIAN EPC COMPARATIVE ADVANTAGE

The Australian construction industry is both an integral partner in building the infrastructure required for Australia's future prosperity, and an important economic contributor, employing 1.1 million Australians and contributing \$A134.2 billion towards Australia's Gross Domestic Product, second only to the Services industry²⁴. The industry itself however, has been identified as susceptible to two key factors²⁵:

1. Rising requirements and demand in terms of volume / time, cost, and quality/ sustainability, and;
2. Rising wages, labour shortages, and limits placed on migrant labour

As a result, the construction industry needs to look to adopting higher quality and lower prices at scale, whilst providing 'payback on up-front and ongoing investments in technology and skill building'²⁶. Without strategically doing so, the Australian construction industry stands to miss out on enormous global construction growth (85% growth to \$A15.5 trillion by 2030), and export opportunities such as construction products and management services²⁷.

Recognising the importance of the construction industry to their 'economies and the opportunities presented by the global construction market'²⁸, many countries have begun developing strategies so that their construction industries may compete in

24 (Commonwealth Government, 2016, p. 33)

25 (McKinsey&Company, 2017, p. 13)

26 (McKinsey&Company, 2017, p. 11)

27 (Univeristy of New South Wales, 2017)

28 (Univeristy of New South Wales, 2017)

the ‘global construction race’²⁹. Even with the Australian construction industry touted as among the world’s most productive, Australia still holds no clear strategy to take advantage of global opportunities³⁰.

Korea’s Ministry of Land, Infrastructure and Transport for example, has identified a global construction strategy as outlined in ‘50 year history of Korea’s overseas construction; creating a new Korea’³¹. The strategy identifies building information modelling (BIM; the combination of digital technology, new materials and advanced automation) as a Korean construction industry competitive advantage, in addition to highlighting four key areas of development: water resource management, urban development, transportation infrastructure and green energy³².

Whilst it is important that the Australian construction industry develop its own unique strategy to capitalise on its competitive advantages, establishing construction diplomacy between Korea and Australian construction industries should prove mutually beneficial. In particular, pairing the Korean construction industry’s BIM and financing capabilities³³, with the Australian construction industry’s ability to attract better talent resulting in strong middle management and greater productivity, presents enormous possibilities both domestically and internationally³⁴.

5. IDENTIFYING KEY KOREAN EPCS

Korea holds a growing global reputation for delivering large scale construction and engineering projects³⁵. Korean EPC contractors have collectively delivered over \$US700 billion in projects in more than 149 countries since the 1960s³⁶. Given that eight Korean contractors were listed in the 2016 Engineering News-Record, Top 100 International Contractors (refer to Table 2), and the scale of Korea’s expertise across EPC³⁷, there is potential for Australian EPCs to leverage Korean EPC partnerships both domestically and internationally.

Table 2: Key Korean Engineering and Construction companies - domestic and international markets³⁸

KOREAN EPC CONTRACTORS LISTED IN THE 2016 TOP 100 INTERNATIONAL CONTRACTORS RANK	KOREAN CONSTRUCTION COMPANIES
13	Hyundai Engineering and Construction Co. Ltd.
17	Samsung Construction & Trading Contractors Corp.
26	GS Engineering and Construction
29	Samsung Engineering Co. Ltd.
39	SK Engineering and Construction Co. Ltd.
42	Daelim Industrial Co. Ltd.
50	Posco Engineering and Construction
51	Daewoo Engineering & Construction CO. Ltd.
85	Hanwha Engineering and Construction

Source: Engineering News Record, 2016

30 (University of New South Wales, 2017)

31 (McKinsey&Company, 2017)

32 (Ministry of Land, Infrastructure, and Transport, 2016)

33 (Ministry of Land, Infrastructure, and Transport, 2016)

34 (Ministry of Land, Infrastructure, and Transport, 2016)

35 (McKinsey&Company, 2017)

36 (United Kingdom Government, 2013)

37 (Australian Trade Commission, 2016)

38 (Engineering News-Record, 2016)

39 (Engineering News-Record, 2016)

Korean EPCs despite their relatively new entry into the Australian market, have been awarded a number of high profile Australian infrastructure projects, such as Roy Hill (iron ore mine and rail development) located in the Pilbara region of Western Australia, and the WestConnex project in Sydney.

5.1 WestConnex

WestConnex is an \$A11-11.5 billion project separated into six phases, with the project designed to assist in shifting Sydney's 'traffic and heavy vehicles to an underground motorway'³⁹. Samsung Construction & Trading Contractors (Samsung) in a joint venture with CPB Contractors (part of CIMIC Group Ltd.) and John Holland will be designing and constructing the first underground section of the WestConnex, known as M4 East⁴⁰. The M4 East project due to open in 2019, is valued at \$A3.8 billion and moved into the construction phase in March 2016⁴¹. Similarly Samsung, in a joint venture with CPB Contractors and Dragados will be designing and constructing twin underground motorway tunnels from Kingsgrove to a new St Peter's interchange in Sydney, known as New M5⁴². The New M5 project is valued at \$A4.3 billion and is currently in construction and due to open in early 2020⁴³. KDB has assisted Samsung's involvement through the provision of finance for the project.

5.2 Roy Hill

Roy Hill 'is a recently developed 55 million tonne per annum iron ore mining, rail and port operation in West Australia's Pilbara region'⁴⁴, estimated to cost \$US5.6 billion⁴⁵. Samsung were engaged as the EPC partner to build the 347 kilometre railroad, port, and plant in which Hancock Prospecting holds a 70% share, while POSCO, Marubeni and China Steel own the remaining 30%⁴⁶. It is understood that the project was technically challenging and many lessons have been learnt on foreign delivery of major Australian projects.

5.3 Gladstone LNG Project

SK Engineering and Construction Co. Ltd. (SKEC) and Laing O'Rourke Australia Construction Pty Ltd were appointed in 2010 by Liquefied Natural Gas Limited (LNG Limited) as EPC Contractors for the Gladstone LNG Project following the completion of the Front End Engineering Design (FEED)⁴⁷. The fixed price project was set at \$US750 million for the first LNG train, a 180,000m³ LNG tank (5.25mtpa) and associated site infrastructure⁴⁸.

Given SKEC's 'sound understanding of the company's (LNG Limited) project development philosophy and the benefits of SKEC's OSMR® process technology'⁴⁹, it signed a MoU with LNG Limited's subsidiary Magnolia LNG in 2014 as the primary EPC contractor for 'Magnolia LNG's 8Mtpa liquefied natural gas project in Lake Charles, Louisiana'⁵⁰. Korean Gas Company (KOGAS), the world's largest buyer of LNG, has a 15% interest in the Santos operated Gladstone LNG project.

5.4 Moolarben

In June 2016 POSCO Engineering and Construction (POSCO E&C), completed a \$US50 million 'plant designed to mine soft coals for Moolarben Coal Operations Pty Ltd'⁵¹. Following the projects' successful completion, POSCO was awarded an additional contract to expand an underground soft coal mine.

40 (New South Wales Government, 2016)
 41 (New South Wales Government, 2016)
 42 (New South Wales Government, 2016)
 43 (New South Wales Government, 2016)
 44 (New South Wales Government, 2016)
 45 (Roy Hill, n.d.)
 46 (Business Korea, 2015)

47 (Business Korea, 2015)
 48 (Liquefied Natural Gas Limited, 2010)
 49 (Liquefied Natural Gas Limited, 2010)
 50 (LNG Industry, 2014)
 51 (LNG Industry, 2014)
 52 (Business Korea, 2016)

5.5 Prelude Floating LNG

The Prelude Floating LNG project is a global project based off the coast of Western Australia led by Royal Dutch Shell, KOGAS and Japan’s INPEX with the construction being undertaken in Korea, Australia and other facilities in Asia and Europe. The project has engaged Samsung Heavy Industries and Technip to build the Central Processing Platform the world’s largest offshore facility currently constructed. The project has seen Australian based employees relocate to Korea to support Samsung Heavy Industries and its subcontractors. The project is also likely to see Australian based maintenance contractors win substantial long term maintenance contracts.

6. OPPORTUNITIES TO PARTNER WITH KOREAN EPC CONTRACTORS

Given Korean EPC contractor reputation and experience in delivering completed projects at a cumulative value of \$US700 billion since the 1960s⁵², the potential opportunity to partner with Australian EPC contractors is twofold.

There is an immediate opportunity to utilise Korean EPC contractor BIM capability and sector expertise (water management, transport projects and renewable energy) and Korean institutional investor activity within the Australian market, and combine it with Australian construction delivery and engineering / project management capabilities and the local understanding of the market and employment law.

In the long term there is opportunity to leverage domestic partnerships between Korean and Australian EPC contractors to enter other markets in the developing Asia Pacific region (e.g. Indonesia has outlined a significant need for development of road, rail and ports).

Capitalising on Korean EPC contractor expertise and synergies, the following three sectors; liquefied natural gas, renewable energy, and the Australian service sector have been identified as areas of opportunity for sector growth and to develop partnerships with Korean EPCs.

6.1 Liquefied Natural Gas (LNG)

LNG is set to overtake metallurgical coal as Australia’s second largest resources and energy export in 2017-18⁵³, increasing from \$A17 billion (2015-16) to \$A42 billion by 2021-22⁵⁴. The growth in Australian LNG is supported by higher prices and export volumes⁵⁵, with much of this demand coming from Korea, the world’s second largest importer of LNG.

At present Korea Gas Corporation (KOGAS), the nation’s sole LNG provider, has interests in two Australian LNG operations (Gladstone LNG and Prelude Floating LNG)⁵⁶. Further, drawing on Korean EPC and financial expertise in developing the successful operation of LNG production bases⁵⁷, will remain a critical input into the FEED and construction phase of Australia’s LNG lifecycle.

Korean shipyards and the Korean construction industry are supporting the Prelude and Ichthys LNG projects in Western Australia, deploying leading technologies and construction capabilities. These multi-billion projects have provided further opportunity to strengthen the Korean-Australian relationships, with Australian labour providing project management and technical support in Korea.

6.2 Renewable Energy

Following an agreed upon Renewable Energy Target (RET) passed through the Australian Parliament on 23rd June 2015, 23.5 percent of Australia’s domestic electricity generation by 2020 is expected to be generated through renewables⁵⁸.

The ‘Promotion of the Development, Use and Diffusion of New and Renewable Energy’⁵⁹ Act, passed by the Korean Government in 2004, has committed Korea towards becoming one of the five largest producers of new energy and renewable energy⁶⁰.

53 (Australian Trade Commission, 2016)

54 (Department of Industry, Innovation and Science, 2017, p. 62)

55 (Department of Industry, Innovation and Science, 2017, p. 62)

56 (Department of Industry, Innovation and Science, 2017, p. 62)

57 (KOGAS, 2017)

58 (KOGAS, 2017)

59 (Department of Environment and Energy, 2015)

60 (London School of Economics, 2011)

61 (KPMG, 2015)

This has led to €EU25.8 billion (\$US34.2 billion) being invested into renewable energy prior to 2015⁶¹, with the government committing a further \$US36.6 billion in 2016⁶². Under the newly elected Korean President Moon Jae In, the proportion of electricity generated from renewable energy is projected to almost double, accounting for 20 percent of generation by 2030⁶³. Greater detail on the actual changes, are due to be released by the Ministry of Trade, Industry and Energy's in their eighth annual report later this year ⁶⁴.

With the Korean Government commitment to this target and in an effort to move away from its dependency on imported energy, Korean EPCs have developed expertise in four key areas⁶⁵:

1. Strategic research and development and commercialisation
2. Promotion of industrialisation and market creation
3. Exportation of new renewable energy products, and;
4. Infrastructure development.

As a result, Korean EPCs are likely to be well placed in establishing a dominant position within the renewable energy sector, leveraging the Australian Government's target of 23.5 percent of domestic energy required by 2020 to be sourced from renewables⁶⁶. Project delivery, will likely provide an opportunity for Australian EPCs and subcontractors to team with Korean EPCs and develop greater relationships with potential Korean primary EPCs.

6.3 Leveraging Australian service sector expertise

Australia's services sector is a significant part of the economy, equal to 70 percent of Australia's GDP and employing four out of five Australians⁶⁷. Areas of expertise include, professional services, financial services, financial technology (FinTech), as well as energy and mining-related services⁶⁸. Increasingly, these areas of expertise have become an important component in Australia's international trade, with service exports 'growing by an average of 3.2 percent annum over the last five years'⁶⁹.

Capitalising on Australia's strong services sector, Australian businesses have the potential to provide specialised, high value expertise in areas such as architectural services, engineering support and engineering construction for Australian based projects, in addition to projects in offshore markets⁷⁰. Opportunities to do so are increasing, with the emerging Asian middle class driving demand for quality social and economic infrastructure⁷¹. Australia also has the capabilities to provide, financial and legal services to major projects.

Table 3: High value Australian expertise

ARCHITECTURAL SERVICES	ENGINEERING SUPPORT	ENGINEERING CONSTRUCTION
<ul style="list-style-type: none"> • Master planning; • Architectural design; • Landscape design. 	<ul style="list-style-type: none"> • Construction; • Manufacturing; • Mining transport; • Environmental sectors; • Project Management. 	<ul style="list-style-type: none"> • Railways and ports; • Dams; • Roads and bridges; • Major pipelines.

Source: Australian Trade and Investment Commission, 2017

62 (KPMG, 2015)

63 (IBT, 2016)

64 (The Korea Herald, 2017)

65 (The Korea Herald, 2017)

66 (London School of Economics, 2011)

67 (Department of Environment and Energy, 2015)

68 (Department of Foreign Affairs, 2016)

69 (Department of Foreign Affairs, 2016)

70 (Department of Foreign Affairs, 2016)

71 (Australian Trade and Investment Commission, 2017)

72 (Commonwealth Government; The Myer Foundation, 2015)

7. PIPELINE OF AUSTRALIAN INFRASTRUCTURE, RESOURCE AND ENERGY PROJECTS

7.1 Infrastructure Projects

Infrastructure Australia, established in 2008 is an independent statutory body 'that is the key source of research and advice for governments, industry and the community on nationally significant infrastructure needs'⁷². As such, Infrastructure Australia often releases a revised Infrastructure Priority List, in which projects are identified based on their priority (high, medium), timescale, and development stage: business case development, initiative development, options assessment, and various stages⁷³.

Upcoming opportunities identified in the most recent Infrastructure Priority List⁷⁴ (February 2017) are outlined below (not an exhaustive list).

New South Wales:

- The Northern Road Upgrade
- Bringelly Road Upgrade Stage 2

South Australia:

- Eyre Infrastructure Project (Iron Road)
- Adelaide – Tarcoola Rail Upgrade Acceleration

Victoria:

- Inland rail (Melbourne to Brisbane via inland NSW)
- Murray Basin Rail Project

Tasmania

- Hobart Science and Technology Precinct

Queensland

- M1 Pacific Motorway – Gateway Motorway merge upgrade
- Bruce Highway Upgrade – Cooroy to Curra Section C
- Bruce Highway Upgrade – Mackay Ring Road Stage 1
- M1 Pacific Motorway upgrade – Mudgeeraba to Varsity Lakes

For information on Infrastructure Australia's National Priority List, as well as all planning and feasibility studies being undertaken by government⁷⁵, the National Infrastructure Construction Schedule (NICS) website combines nation-wide information on major infrastructure projects across all three tiers of government. Enabling the construction industry, investors, governments and the public to view the national pipeline of upcoming infrastructure projects where governments have committed to fund construction in a single timeline⁷⁶.

72 (Australian Infrastructure Plan, 2016, p. 2)

73 (Australian Infrastructure Plan, 2016)

74 (Infrastructure Australia, 2017)

75 (Department of Infrastructure and Regional Development, 2017)

76 (Department of Infrastructure and Regional Development, 2017)

7.2 Resource and Energy Projects

The Department of Industry, Innovation and Science releases the Resource and Energy Major Projects report in December each year, detailing activity across four development stages (publicly announced, feasibility stage, committed and completed). Whilst the purpose of the report is to measure the value of current and potential investment in the mining and energy sectors associated with either extending or improving the output of mineral and energy commodities in Australia, the report also provides aggregated national project information⁷⁷.

Tables 4 and 5 below provide details of opportunities identified in the latest report over two stages: feasibility and committed. Projects that have progressed to the feasibility stage have undertaken initial project definition studies and commenced to more detailed planning.

Table 4: Projects that have advanced past the feasibility stage in the 12 months prior to October 2016

RESOURCE	PROJECT	PARTIES INCLUDE	STATE	ESTIMATED START-UP	INDICATIVE COST (\$AM)
Oil and Gas	Lambert Deep West	Woodside, BHP, BP, Chevron, Shell, Japan Australia LNG	WA	2021+	\$A1,000 – 1,500
Resource Infrastructure	Buckland road and port infrastructure	BC Iron	WA	2021+	\$A1,250
Copper	Carrapateena	Oz Minerals Limited	SA	n/a	\$A800
Infrastructure	Northern Gas Pipeline	Jemena	NT	2018	\$A800
Uranium	Yeelirrie	Cameco	WA	2021+	\$A500 – 1,000
Coal	New Lenton	New Hope Coal, MPC	QLD	2019	\$A400
Zircon, ilmenite, leucoxene	Thunderbird	Sheffield Resources	WA	2019	\$A393

Source: Department of Industry, Innovation and Science, 2016

Committed projects have completed all commercial, engineering and environmental studies, received all necessary Government regulatory approvals, and finalised the financing of the project to allow construction⁷⁸.

77 (Department of Industry, Innovation and Science, 2016)

78 (Department of Industry, Innovation and Science, 2016, p. 5 & 6)

Table 5: Projects that have advanced to the committed (construction phase) stage in the 12 months prior to October 2016

RESOURCE	PROJECT	PARTIES INCLUDE	STATE	ESTIMATED START-UP	INDICATIVE COST (\$AM)
Gas and oil	Greater Western Flank Phase 2	Woodside, BHP, BP, Chevron, Shell, Japan Australia LNG	WA	2019	\$A2,000
Gas and oil	Greater Enfield	Woodside, Mitsui E&P Australia	WA	2019	\$A1,900
Bauxite	Amrun (South of Embley Project)	Rio Tinto	QLD	2019	\$A1,900
Gas and oil	Charlie	BG Group, CNOOC, Tokyo Gas	QLD	2017	\$A1,700
Zinc	Dugald River	MMG	QLD	2018	\$A812

Source: Department of Industry, Innovation and Science, 2016

In addition to the above projects identified, the Bylong (KEPCO owned), Wallarah 2 (Korea Resource Corporation owned) and the Hume (POSCO owned) coal projects have been progressing with further exploration and development and environmental approvals, with construction to commence in 2017 / 2018, subject to obtaining the appropriate approvals.

8. CONCLUSION

To drive economic growth, increase employment and enhance the quality of life for all Australians, productive and sustainable infrastructure is essential. EPC contractors are key in the provision of infrastructure that Australia needs, in order to meet the growth and transformation that is both required and expected. Whilst Australian EPC contractors are well placed to benefit, there is an opportunity to leverage Korean EPC expertise and investment to meet gaps in Australia's infrastructure capability and funding needs, and in doing so establish relationships that may see to joint ventures in offshore markets, and utilisation of Australia's service sector expertise (architectural, engineering support and construction services among other professional services). The following table (6) highlights both present and future sectoral opportunities, as identified within the report.

Table 6: Present and future opportunities

OPPORTUNITIES IDENTIFIED	TIMING
Korean institutional investment in Australian funds, or directly into infrastructure projects	To grow significantly over the next five years as KAFTA opens opportunities for additional Korean capital flows to Australian fund managers
Engage Korean EPC expertise in developing LNG plants in foreign markets – in addition to Korea being the 2nd largest importer of LNG	Current, refer to Table 4 for upcoming projects

OPPORTUNITIES IDENTIFIED	TIMING
Engage Korean EPC expertise in the renewable energy sector, to meet the Australian Govt. target of 23.5% by 2020	Current
Provide architectural services, engineering support and engineering construction in Australian based and offshore market deals	Growth opportunity
Leverage Korean EPC expertise in offshore and engage in joint ventures domestically	Both current and a growth opportunity

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