appea the voice of australia's oil and gas industry

Submission

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Western Australian Legislative Assembly Economics and Industry Committee: Inquiry into the Economic Implications of Floating Liquefied Natural Gas Operations – Supplementary Submission

CONTENTS

INTRODUCTION **3**

OVERVIEW **3**

ACTIONS NEEDED TO ADDRESS CURRENT ISSUES & CAPTURE OPPORTUNITIES **4**

ADDITIONAL RECOMMENDATIONS 4

THE OPPORTUNITY **5**

THE CHALLENGES **5**

GLOBAL COMPETITIVENESS 6
REGULTORY BURDEN – CASE STUDIES 9
DOMESTIC ENERGY SECURITY 13

THE PRIZE **16**

SUPPLY CHAIN 17
SKILLS DEVELOPMENT 18

ATTACHMENT 1 – ENVIRONMENTAL REGULATION CASE STUDY 1 ..... **20**

ATTACHMENT 2 – ENVIRONMENTAL REGULATION CASE STUDY 2 ..... **22**

ATTACHMENT 3 – ESTIMATED COST IMPACTS OF DEVELOPMENT ASSESSMENT AND APPROVAL DELAYS **25**

ATTACHMENT 4 - INDIVIDUAL OFFSHORE & MARINE SUPPORT SERVICES CONTRACTS **27**

INTRODUCTION

The Australian Petroleum Production & Exploration Association (APPEA) welcomes the opportunity to provide a supplementary submission to the Western Australian Legislative Assembly Economics and Industry Committee: Inquiry into the Economic Implications of Floating Liquefied Natural Gas (FLNG) Operations.

APPEA's supplementary submission builds on our earlier submission provided in September 2013 and provides responses to specific lines of questioning at our public hearing on 1 November 2013. The supplementary submission also draws upon new information made available following our earlier submission.

OVERVIEW

- The gas industry is expected to be the fastest growing industry across the globe and Western Australia (WA) is well positioned to capture the significant opportunities available through the large resources of natural gas onshore and offshore and nearly half a century of expertise in the oil and gas industry here. FLNG is one of the suite of options available for offshore gas field development in Australia, along with onshore greenfield and brownfield expansion.
- Australia is the driving force in global liquefied natural gas (LNG) development with $200 billion worth of investment in new LNG plants, representing more than two-thirds of the global investment in LNG capacity and one-third of Australian business investment. More than half of this is taking place off WA and across the country it is estimated that another $180 billion in gas projects could be developed.
- However, Australia's cost competitiveness and increasing regulatory burden threaten to derail the opportunity to capitalise on our natural good fortune, by failing to attract the high levels of investment needed to capture this substantial next wave.
- FLNG brings with it a different, but significant, set of opportunities for Australian enterprises and employment in subsea, installation, operations, workforce development and research. Australian firms will be afforded opportunities to participate in the capital expenditure phase of FLNG projects, especially in subsea.
- With education and training also set to be a key growth industry for the Australian economy, WA has a real chance to link the substantial opportunities available in gas and skills and knowledge development to position the state as a global/regional research centre of excellence in areas where we have comparative strengths, such as offshore foundations systems, process operator training and subsea technology.
- Collaborative Centres of Excellence will help tighten links between university and industry research and build on existing clusters of capability and competitiveness within WA and further enhance the State's position as an international hub for the oil and gas industry.
- WA's domestic energy security is best delivered through efficient operating markets and by encouraging new entrants and competition. Market forces, price movements and growth of the gas export industry will continue to drive WA's domestic gas market.

ACTIONS NEEDED TO ADDRESS CURRENT ISSUES & CAPTURE OPPORTUNITIES

1. Mechanisms that encourage collaboration and further investment in Western Australia (WA) among all those involved in the oil and gas sector, including SMEs, should be supported by the State Government. In particular, the Coalition's foreshadowed new initiative to establish a potential Oil and Gas Collaborative Centre of Excellence in WA should be supported, alongside the existing WA: ERA partnership and the proposed floating systems research partnerships with local universities and CSIRO. The Australian Centre for Energy and Process Training (ACEPT) provides a strong foundation in the skills development area and should be further expanded[1].
2. Encouragement for development of onshore, as well as offshore, oil and gas must be pursued as a priority area within the State's energy security, State development and regulatory initiatives.
3. The WA Government should undertake its planned review of the domestic gas reservation policy, taking account of the evidence from the Independent Market Operator that shows the State has a well-functioning market. The review should be informed by analysis of the impacts to the WA and Australian economies of the WA domestic gas reservation policy conducted by the WA Economic Regulation Authority (ERA)[2].
4. Initiatives aimed at working collaboratively with the Australian Government and industry should be supported by the WA Government, to identify the skills and services that will be needed to support FLNG operations and structures based on an assessment of WA's comparative strengths and weaknesses. Resources should be put into priority areas to capture the significant long-term opportunities presented by FLNG projects[3].

ADDITIONAL RECOMMENDATIONS

5. Government and businesses need to constructively work together to develop adaptive workplaces and agile workforces. To support this, the *Fair Work Act 2009* should be amended to allow for alternative and genuine non-union agreement options to be available in order to provide greater certainty for investment in major projects.
6. The WA government should continue to work with the Australian Government to lessen the regulatory burden facing the offshore oil and gas industry in the state, with a view to removing duplication and streamlining the interface with multiple government regulatory agencies.
7. The WA Treasurer task the Economic Regulation Authority, through its Microeconomic Reform Inquiry, to undertake a full, economy wide analysis of the impacts to the WA and Australian economies of the WA domestic gas reservation policy in 2014-15.

[1] Original recommendation amended.
[2] Original recommendation amended.
[3] Original recommendation amended.

THE OPPORTUNITY

Australia is the driving force in global LNG development with some $200 billion worth of investment in new LNG plants, representing more than two-thirds of the global investment in LNG capacity. This current wave of investment represents around one in every three dollars of Australia's entire business investment spend[4]. More than half of this is taking place off Western Australia and across the country it is estimated that another $180 billion in gas projects could be developed.

The global outlook for natural gas is bright. While the International Energy Agency forecasts that demand in Australia's traditional export destinations remains relatively flat, gas demand in China is set to quadruple and in India almost treble over the period to 2035[5]. This global demand for natural gas is being driven by a combination of energy diversification, a desire to reduce greenhouse gas emissions and a desire for improved air quality outcomes.

Supporting this outlook, analysis by Deloitte Access Economics recently projected that the gas industry will be the fastest growing industry across the globe, with a forecast average annual growth rate of over 4 per cent, more than 10 per cent above the average global gross domestic product over the next 20 years[6].

Western Australia is well positioned to capture the significant opportunities available through the large resources of natural gas onshore and offshore and nearly half a century of expertise in the oil and gas industry here. Importantly, FLNG is one of the suite of options available for offshore gas field development, along with onshore greenfield and brownfield expansion.

However, Australia's cost competitiveness and increasing regulatory burden threaten to derail the opportunity to capitalise on our natural good fortune by failing to attract the high levels of investment needed to capture this substantial next wave.

THE CHALLENGES

For Australia, and Western Australia, a number of challenges need to be addressed to capture the significant opportunities that come with a further $180 billion in investment waiting in the wings.

These challenges are addressed below in the following sections, where specific examples are provided:

- Global competitiveness;
- Regulatory Burden – Case Studies; and
- Domestic Energy Security.

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[4] Deloitte Access Economics 2013, *Positioning for prosperity? Catching the next wave, p. 24*
[5] IEA 2013, *World Energy Outlook* 2013, p. 99
[6] Deloitte Access Economics 2013, *Positioning for prosperity? Catching the next wave, p. 7*

GLOBAL COMPETITIVENESS

Australia's perception as a welcoming destination for investment is in decline, including for petroleum investment. The World Economic Forum (WEF), in its annual global competitiveness report, has just ranked Australia outside the top 20 countries for the first time[7]. More recently, the well-respected Fraser Institute has ranked Western Australia 49th and Australia – Offshore 54th out of 157 jurisdictions for petroleum investment attractiveness[8]. For Western Australia, this represents a continued slide from a rank of 21st in 2010, which at the time was seen as a major achievement for the WA Government and the positive reform initiatives that were recognised by the petroleum industry[9].

A number of organisations have put forward specific evidence to the Committee concerning the high costs of building resource projects in Australia. In an environment of significant global competition for capital, Australian LNG projects are at a cost competitive disadvantage.

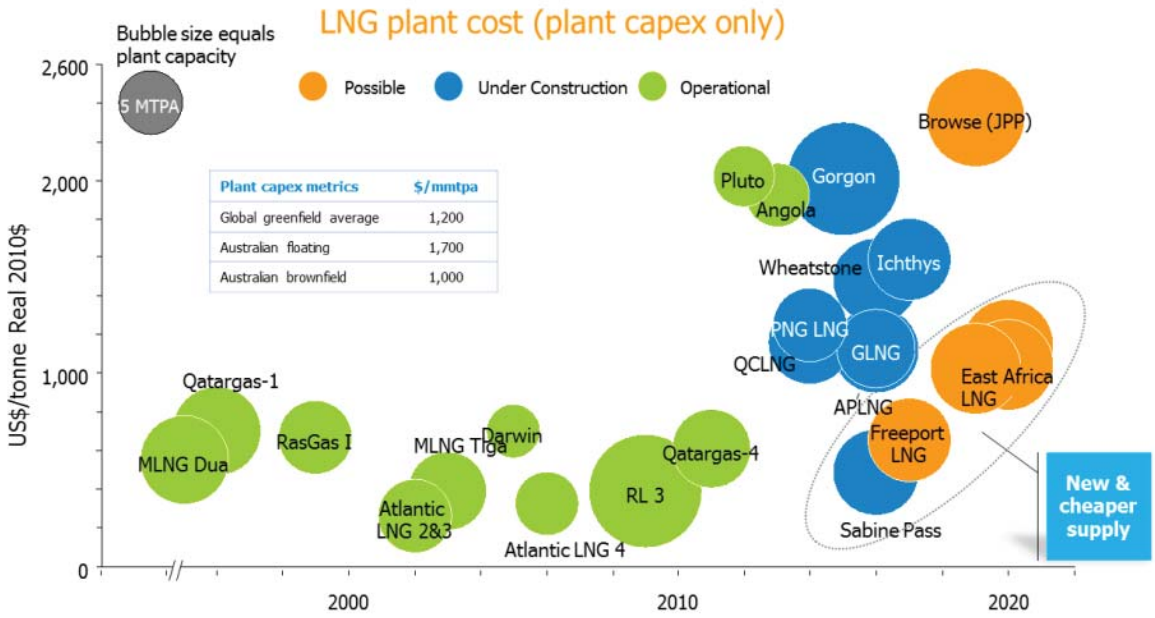


Figure 1: Santos, 2013, Global comparison of LNG plant capex costs

Cost challenges are not unique to the oil and gas industry; many Australian industries are facing global competitive challenges, most notably in specific sectors of the Australian manufacturing industry. Indeed Alcoa recently told a WA business forum that it was cutting 160 jobs from its

[7] World Economic Forum 2013, *The Global Competitiveness Report 2013–2014*
[8] Fraser Institute 2013, *Global Petroleum Survey, 2013*, p. 17
[9] See: www.mediastatements.wa.gov.au/Pages/StatementDetails.aspx?StatId=3024&listName=StatementsBarnett

local operations and pushing all of its contractors to reduce their rates by 12 per cent to improve efficiency and productivity[10].

In addition to cost challenges, the increased regulatory burden facing Australian business is hampering our ability to quickly react to changing global conditions and remain competitive. Australian business, across the board, cite labour regulations and bureaucratic red tape as being, respectively, the first and second most challenging factors for doing business here, as highlighted in Figure 2.

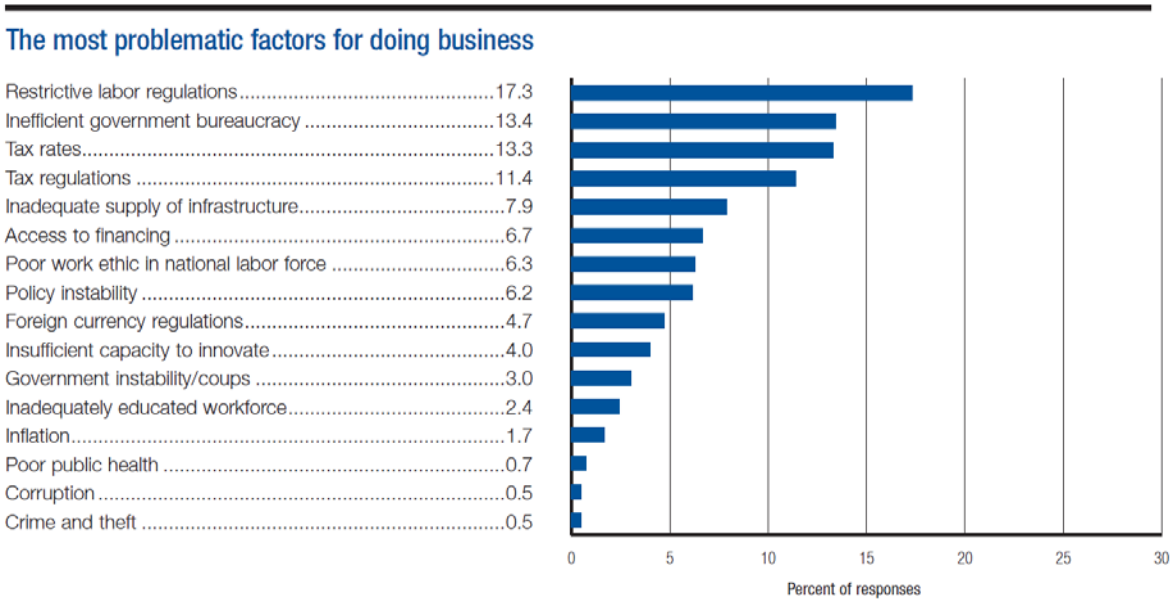


Figure 2: WEF, *The most problematic factors for doing business in Australia*, 2013

The main area of concern identified by Australian business in the recent WEF report is the rigidity of our labour market (54th), where the situation continues to deteriorate further. Australia ranks 137th out of 148 countries for the rigidity of hiring and firing practices and 135th for the rigidity of wage setting. Australia is ranked 128th for the burden of government regulation compared to 96th last year and 60th the year before.

Consistent with the WEF report, petroleum companies operating offshore Australia and in WA, consider inflexible labour regulations are a major deterrent to investment. The Fraser Institute report raised a number of concerning observations from those operating in the petroleum industry. Of the 157 jurisdictions surveyed, Australian states and territories generally provide regulatory and fiscal stability, while the duplication and cost of regulatory compliance is identified as a significant barrier.

[10] See: http://www.businessnews.com.au/article/Alcoa-squeezes-contractors

Survey Topic	WA Rank (Lower=Better)	Aus – Offshore	Highest Aus Rank
Best Practices	28	40	3 (SA)
Regulatory Duplication	69	75	24 (Tas)
Cost of Regulatory Compliance	80	83	58 (NT)
Regulatory Uncertainty	14	42	8 (NT)
Environmental Regulations	109	119	57 (NT)
Labour Availability	97	105	66 (SA)
Labour Regulations	110	141	64 (NT)
Geological Database	6	7	2 (Tas)
Taxation Regime	59	58	28 (SA)
Fiscal Terms	18	10	3 (SA)

Table 1: Fraser Institute, 2013, Summary of Australian rankings

Addressing rising wages and lower productivity is a major challenge for the oil and gas industry. Recent analysis by Deloitte Access Economics[11] found that wages earned by certain classifications in the offshore marine support sector have almost doubled over the last decade. The growth in offshore marine support sector wages (shown as green in Figure 3) has significantly outpaced growth in the general wage price index over the last decade.

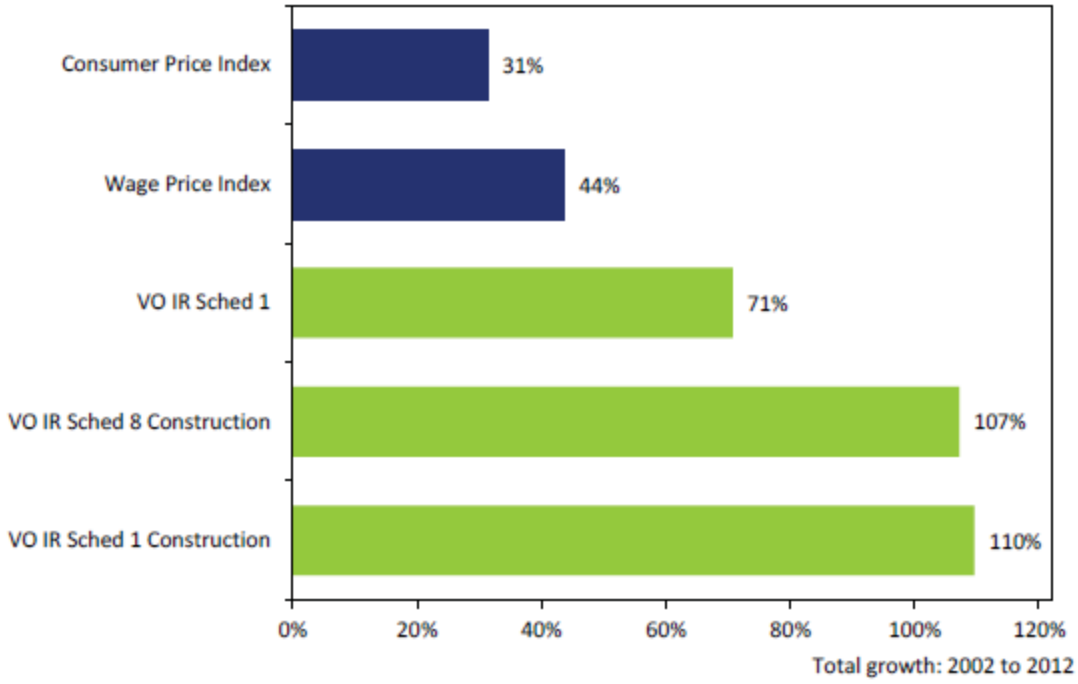


Figure 3: Deloitte Access Economics, *Integrated rating wage growth, 2002 to 2012*

[11] Deloitte Access Economics 2013, *Analysis of the offshore oil and gas marine support sector*

There are a range of labour market barriers embedded in Australia's industrial relations framework that are driving up wages and impacting adversely on productivity in the oil and gas industry. Specifically, APPEA's submission to the *Fair Work Act 2009* Review[12] identified:

- the requirement to negotiate greenfields agreements exclusively with employee organisations, which has exposed major projects to unreasonable union demands;
- requirements allowing unions to insist on the inclusion of restrictive provisions, such as restricting the right to employ contractors, that run counter to the productivity objective referred to in the Object of the Act (at section 3(a)); and
- unions having right of entry to a site, regardless of whether they have members on that site.

Commitments to new resource developments in Australia have slowed markedly over the last year. As the International Energy Agency (IEA) recently noted, the prospects for another round of major Australian projects will depend heavily on how costs evolve, on the deployment of new, less costly technologies, such as FLNG, and on competition from other regions, notably North America and East Africa[13]. If not addressed, these cost and productivity challenges threaten to hold back plans for additional export projects.

Recommendation: Government and businesses need to constructively work together to ensure that Australia remains an attractive and competitive destination for capital. To support this, the *Fair Work Act 2009* should be amended to allow for alternative and genuine non-union agreement options to be available in order to provide greater certainty for investment in major projects.

REGULTORY BURDEN – CASE STUDIES

A recent report produced by APPEA, *Cutting green tape: streamlining major oil and gas project environmental approvals processes in Australia*[14] identified through a number of case studies, specific examples of duplication of environmental regulation across state and federal boundaries. The extent of regulatory duplication is illustrated in Figure 4 below.

[12] See: http://www.appea.com.au/wp-content/uploads/2013/04/120305_FWA-Review-docx.pdf
[13] IEA 2013, *World Energy Outlook* 2013, p. 99
[14] See: http://www.appea.com.au/wp-content/uploads/2013/04/APPEA_Cutting-Green-Tape.pdf

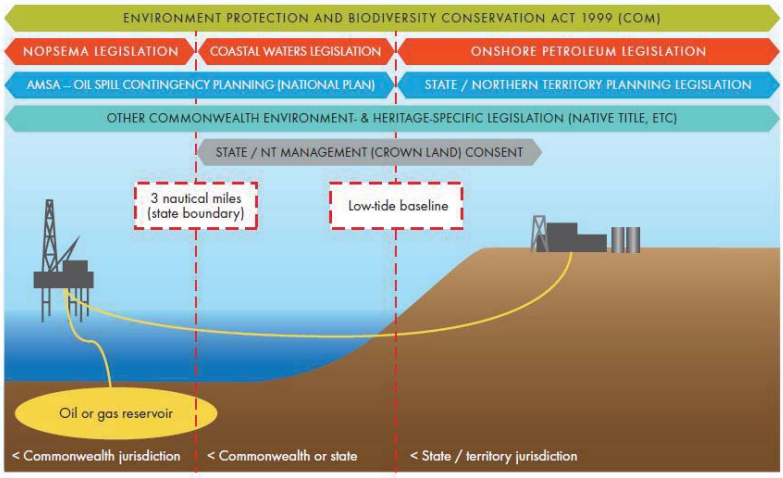


Figure 4: APPEA, Legislative scheme for offshore field development with onshore processing

Of particular interest to the Committee, two of the case studies in APPEA's *Green Tape Report* demonstrate the prevalent and pervasive nature of inconsistent and duplicative Commonwealth and state environmental legislation for both onshore and offshore oil and gas development.

Offshore Field to Onshore Development

Common to many large projects that require State and Commonwealth environmental approvals, there are a range of challenges that arise from the complex interplay between State and Commonwealth processes. These challenges include overlapping processes and a resulting duplication of conditions and associated requirements. Experience from the Gorgon Project highlights the differences between the State and Commonwealth approvals processes when a project requires change (that is, a variations and or expansion of its scope) and or its management plans.

As a result of duplication of State and Commonwealth Ministerial Statement conditions, the same environmental management plans are required to be assessed and approved by different agencies/Ministers. This requires considerable resources for all parties to commit to consultation and negotiation to (preferably) generate a single plan that meets the respective needs of the various agencies. For example, notwithstanding the other agencies/stakeholders that need to be consulted, the Offshore Feed Gas Pipeline Construction Management Plan has to be assessed and approved by the WA Department of Environment Regulation (DER), WA Department of Mines and Petroleum (DMP), Commonwealth Department of Environment (DOE) and NOPSEMA. Further detail is provided at Attachment 1.

Oil Spill Contingency Planning

For offshore oil and gas projects located in Commonwealth coastal waters off Western Australia, five different Commonwealth and state bodies review and consult on one single mandatory environmental requirement.

As a part of offshore environmental approvals, operators develop detailed Oil Spill Contingency Plans (OSCPs) for the unlikely event of an oil spill. The duplicative approval processes for these plans by five regulatory agencies is a clear burden and limits effective and clear risk planning. Further detail is provided at Attachment 2.

Recent announcements by the Australian Government to establish a 'one-stop-shop' environmental approval process for offshore petroleum and greenhouse gas storage activities are supported by the oil and gas industry. As noted in APPEA's *Cutting green tape* report, the environmental impacts of offshore petroleum activities are currently regulated under both the *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act) and the *Offshore Petroleum and Greenhouse Gas Storage Act 2006* resulting in unnecessary duplication and burden on business.

There is still more that can be done to streamline reporting within Commonwealth and state processes (such as removing duplicate reporting to agencies, adding statutory timelines where appropriate) and clarifying the roles and responsibilities of State and/or Commonwealth agencies and legislation.

Cost Impacts of Development Assessment and Approval Delays

The recent Productivity Commission report, *Major Project Development Assessment Processes*[15], underlines the inefficiencies in the regulatory processes that currently apply to major projects in Australia. More importantly, it advances a range of sensible options to streamline the current arrangements and capture the benefits of major projects and investment.

The report represents one of the most comprehensive reviews of the regulatory and oversight processes that apply to resource projects in Australia. It highlights the duplicative and multiple layers of red and green tape that projects must navigate to unlock the economic benefits of our nation's resources.

In the report, the Commission estimates that the indicative cost of a one-year delay to a major offshore LNG project is in the order of $500 million to $2 billion, depending on assumptions made. The central estimate of $1.1 billion represents a reduction in the net present value (NPV) of the investment by about 9 per cent.

The estimates relate to the cost of an unnecessary delay and so it is assumed that the environmental and social outcomes (and related costs and benefits) are unchanged by the delay. Further detail is provided at Attachment 3.

The thrust of the Commission's recommendations are generally supported by the industry, particularly the centrepiece focus on establishing a 'one project, one assessment, one decision' framework for approvals through bilateral assessment and approval agreements and the wider use of strategic assessments.

Australian Jobs Act 2013

The *Australian Jobs Act 2013* (the Act) imposes unnecessary cost burdens on companies while distorting the efforts and outcomes of existing company systems and processes. These aim to provide full, fair and reasonable opportunity for local suppliers to participate in the delivery and operation of major projects.

[15] Productivity Commission 2013, *Major Project Development Assessment Processes*

The upstream oil and gas sector recognises that local suppliers can provide significant advantages to projects through faster turnaround of services, localised employment, improved timings and improved communication.

When coupled with the potential for injunctions and other penalties, the Act introduces a system of onerous and complex administrative requirements to deliver the same results that companies have been achieving for some time. For example, the introduction of a 'trigger date' for the provision of an AIP Plan without a clear definition has created significant ambiguity. As a result, the Act increases uncertainty and escalates compliance costs (particularly for smaller projects and/or those with limited exposure to the existing Enhanced Project By-Law Scheme (EPBS) structure) without a demonstrated commensurate additional benefit to Australian suppliers.

The Act also requires companies to focus on the activities of the Australian Industry Opportunity (AIO) Officer rather than enhancing Australian Industry Participation (AIP) outcomes across an organisation as a whole. Achieving AIP is a matter of enhancing supplier capability and a complex issue which requires people working in concert across an organisation and not just an assigned AIO Officer. A more productive approach would focus on an AIP Plan's objective and provide flexibility for companies to deliver those objectives.

Experience has indicated that key issues preventing the majority of local suppliers from successfully winning work include:

- Having appropriate management systems to address legislative requirements for health, safety and environment;
- Developing the management systems and processes required to prequalify;
- Knowing how to tender and submit compliant tenders;
- Remaining internationally competitive with a high Australian dollar; and
- Complying with globally accepted technical standards for asset integrity and safety.

APPEA believes that the key focus of any reforms should be on increasing supplier competitiveness and capacity. This is the key pre-requisite step in order to address the productivity constraints that are limiting the ability of local suppliers to participate on a global basis. Priority should be placed on creating a dialogue between industry, government and suppliers to address these issues.

A good example is the work of the WA Department of Commerce in leading the Industry Facilitation and Support Program. The program provides dollar-for-dollar financial assistance as a reimbursement to local businesses to improve competitiveness and productivity. Chevron Australia co-funded the most recent round targeting Onslow-based companies other project proponents are considering joint funding future rounds.

Funding includes:

- temporary expert assistance for prequalification;
- improvements to internal business infrastructure; and
- specialist training.

The program has been considered a success in lifting the competitive capability of WA-based suppliers and enabling contract wins[16].

Recommendation: The WA Government should continue to work with the Australian Government to lessen the regulatory burden facing the offshore oil and gas industry in the state, with a view to removing duplication and streamlining the interface with multiple government regulatory agencies.

DOMESTIC ENERGY SECURITY

Western Australia's domestic energy security is best delivered through efficient operating markets and by encouraging new entrants and competition. Market forces, price movements and growth of the gas export industry will continue to drive WA's domestic gas market.

Policies aimed at protecting certain sectors of the economy from the full realities of operating in competitive markets were done away with in the 1980's. Those sectors themselves are only too willing to advocate free trade policies.

Recent analysis by Deloitte Access Economics[17] clearly demonstrates that the introduction of a domestic gas reservation (DGR) on the east coast of Australia would come at a significant cost to the nation's (including WA) economic welfare. Where gas prices do not reflect the true opportunity cost, the impact of a DGR is to effectively place a simultaneous tax on domestic gas production and provide a subsidy on domestic gas consumption. Like all taxes and subsidies, the DGR distorts economic decisions and generates an unequivocal economic loss, one which compounds over time as future investment decisions are affected.

[16] See: http://www.premier.wa.gov.au/Ministers/Michael-Mischin/Pages/mmischin_20131212_Government_investment_into_WA_businesses_a_win_win.aspx

[17] Deloitte Access Economics 2013, *The economic impacts of a domestic gas reservation*

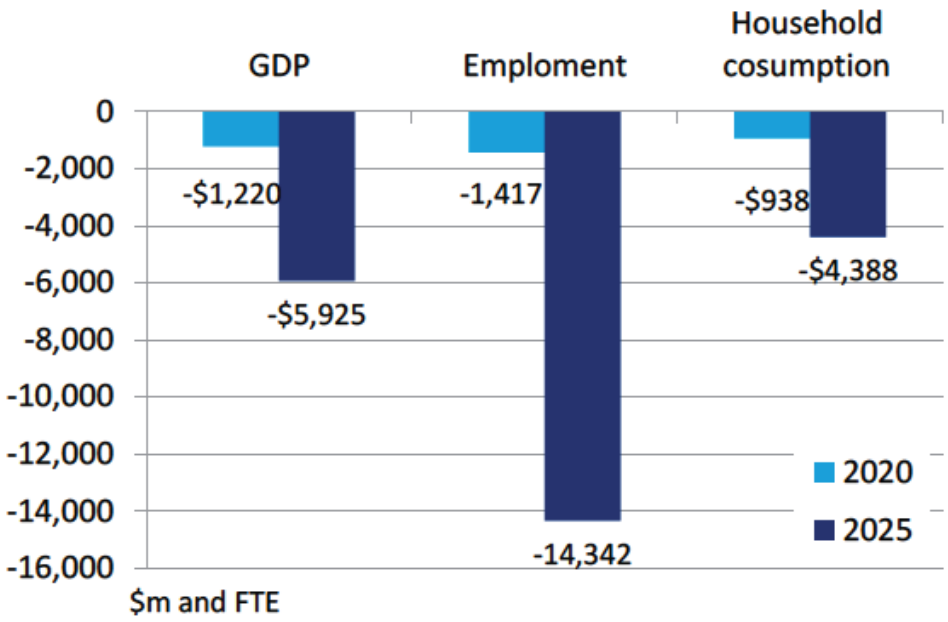


Figure 5: DAE, Aggregate economic impacts of a domestic gas reservation

Against a scenario where production, investment and export decisions are not impeded, the introduction of a DGR in other Australian jurisdictions is projected to cost the Australian (incorporating the WA) economy, $6 billion in forgone gross domestic product (GDP) by 2025.

This should not be surprising. Deferring resources from their highest and best use in the absence of market failure is seldom, if ever, welfare enhancing. A compelling economic case for providing support to one struggling sector is difficult to mount under any circumstances; let alone when this support comes at the direct expense of export income in other sectors.

Analyses undertaken by DGR advocates fundamentally fail to account for the policy's full economic impacts. When the flow on impacts are analysed comprehensively the economic losses are clear. Every one per cent of future gas exports which is artificially re-directed towards the domestic market reduces GDP by an estimated $150 million at 2025.

DGR proponents who promote a "value-adding" rationale, fail to acknowledge that, according to the Australian Bureau of Statistics[18], the oil and gas sector value add ratio is 0.80, compared to an average of 0.28 across the manufacturing sector as a whole (with the ratio in some parts of the sector as low as 0.13). Notably, 0.80 is the highest value added ratio observed in the Australian economy, and 0.13 is the lowest of the value added ratios.

The introduction of a DGR has wider implications, beyond the economic and job losses. Government interventions to artificially reduce domestic wholesale gas prices are often unsustainable and have numerous negative side-effects in terms of economic, energy and environmental policy. While DGR policies may produce low headline prices, there is little

[18] ABS, *Australian National Accounts: Input-Output Tables, 2009-10*

incentive for energy efficiency and often governments must decide on the allocation of scarce gas to particular industries, picking winners on political grounds.

The experience of OECD countries, like the U.S. and Canada, suggests that a freely operating and competitive market is a superior means of achieving sustainable low gas prices in countries with favourable geology like Australia. A free market is consistent with positive economic, energy and environmental outcomes.

In the U.S., export of gas requires government approval; however different processes are in place depending on whether the importing country has a Free Trade Agreement (FTA) with the U.S.. The approval process is a formality for export to countries with which the U.S. has a FTA, such as South Korea and Singapore. Consideration is currently being given to applications for export to non-FTA countries. The decision making process is guided by the principle that exports are in the national interest, and applications are assessed against this positive economic statement. A recent study for the US Department of Energy (DOE) by NERA[19] found that "Across all these scenarios, the U.S. was projected to gain net economic benefits from allowing LNG exports".

WA's domestic gas market is currently supplied through six gas processing facilities, five of which are domestic only facilities not linked to an LNG export project, representing nearly 850 TJ/d of free market capacity.

Facility	Operator	Capacity (TJ/d)
Varanus Island	Apache	390
Devil Creek	Apache	220
Macedon	BHP Billiton	200
Beharra Springs	Origin	25
Red Gully	Empire Oil & Gas	11

Table 2: WA domestic only gas processing facilities

This is the result of buyers willing to commit to contract terms that underpin the enormous investment required to develop and construct a gas processing facility[20]. The market is clearly working and needs to be able to respond to market signals without the unnecessary hindrance of government intervention. Claims that future domestic gas supply is not available at any price are simply not true. There is ample evidence that gas consumers are able to obtain gas supplies on commercial terms. In an environment of limited fiscal capacity, a review of the impacts of the WA DGR on the state's economy is essential.

While the full economic impacts of the Western Australian DGR are still emerging, the overseas experience indicates that policies of this kind have a variety of adverse, unintended consequences. The WA government cites the prevalence of interventionist export restrictions

[19] NERA Consulting 2012, *Macroeconomic Impacts of LNG Exports from the United States*
[20] See: http://www.bhpbilliton.com/home/investors/news/Pages/Articles/BHP-Billiton-celebrates-first-gas-at-Macedon.aspx and http://investor.apachecorp.com/releasedetail.cfm?ReleaseID=357625

amongst LNG producing jurisdictions as justification for WA's DGR policy, while the evidence of recent supply responses shows that the DGR policy is largely unnecessary, as the market is responding to demand[21].

In its recently released Discussion Paper on Microeconomic Reform, the WA Economic Regulation Authority (ERA) has identified five main areas to be considered by the current inquiry. Of relevance to the Committee, the Discussion Paper includes a focus on:

- reviewing the efficiency of current State Government taxes and charges;
- reducing the cost of complying with red tape; and
- examining current restrictions on product markets in Western Australia (including the domestic gas reservation policy).

This is a welcome initiative by the WA Government to tackle some of the key cost and regulatory challenges that are hindering the growth of the oil and gas industry and WA business in general, and to quantify the economic impacts of gas export restriction policies.

Recommendation: The WA Treasurer task the Economic Regulation Authority, through its Microeconomic Reform Inquiry, to undertake a full, economy wide analysis of the impacts to the WA and Australian economies of the WA domestic gas reservation policy in 2014-15.

This analysis will be an important pre-cursor to the planned review of the operation of the domestic gas reservation policy.

THE PRIZE

We need to embrace innovation – like FLNG – and work together to develop the new skills and capabilities needed for the industry's evolution. It is worth recalling that the development of WA's oil and gas industry has been based on a good deal of successful innovation in the past.

In particular, FLNG has evolved from a combination of technologies already used extensively in WA. Floating Production, Storage and Offloading (FPSO) vessels operating off Exmouth currently provide the majority of Australia's oil production. Modularisation of LNG plants is already a feature of most recent onshore LNG plants as one measure to control costs and schedule.

LNG technology has had only one business solution for the better part of three decades – a large onshore plant with large tankage facilities being supplied by an onshore or offshore resource. FLNG adds another string to our bow. It will not be the solution for every offshore gas resource, though it allows the industry to develop alternative business models, enhancing flexibility in

[21] See: http://www.dmp.wa.gov.au/documents/Prospect_September_2013.pdf

resource development options. In some cases, projects will not be viable without this kind of development option.

SUPPLY CHAIN

FLNG is an important development option for offshore fields that may not otherwise be commercialised at all, or in a timely manner. FLNG brings with it a different, but significant, set of opportunities for Australian enterprises and employment in subsea, installation, operations, workforce development and research. There will be opportunities for Australian firms to participate in the CAPEX phase of FLNG projects, especially in subsea.

For example, in the capital expenditure phase, the subsea opportunities associated with FLNG projects can provide substantial work for local contractors:

- In the case of the Prelude FLNG Project (with Concerto), there will be 11 wells, 56km of flowlines, 25km of umbilicals and 6 subsea manifolds
- In the case of the proposed Browse FLNG Project: approximately 64 subsea wells, over 190km of flowlines, 70km of umbilicals and 12 subsea manifolds
- In the case of the proposed Scarborough Project: approximately 12 subsea production wells, up to 125km of flowlines and umbilicals and 24 mooring lines and anchors.

APPEA has already provided evidence to the Committee[22] of the Ichthys Project subsea work which is expected to contain up to 50 subsea wells and associated flow lines, umbilicals and subsea manifolds.

Collectively, this is a substantial amount of subsea work that Australian suppliers have the capacity and capability to be involved in. Indeed, the WA Department of Commerce most recent Local Content Report[23] outlines nearly $2.5bn in local contract spend over the past three years purely on offshore infrastructure and marine support services. Attachment 3 provides a list of individual publicly announced, locally awarded, subsea infrastructure and marine support services contracts.

The substantial amount of contracts being awarded to local companies, as outlined in the Local Content Report, is testament to the oil and gas industries support for initiatives, such as the Industry Capability Network (ICNWA), that aim to support local companies efforts to capture the benefits of the pipeline of investment. APPEA notes the WA Government's recent decision to reduce funding of the ICNWA service[24].

The opportunity to leverage this expertise to position Perth as a global or regional centre of excellence for (F)LNG/offshore technology is real. The challenge will be to move quickly to identify those areas where Western Australia and Australia has a competitive advantage. Global

[22] Australian Venture Consultants 2012 *The Wider Contribution to Australia of the Oil and Gas Industry: Selection of Case Studies from the Development of Offshore Gas Fields*
[23] See: http://www.commerce.wa.gov.au/ScienceInnovation/PDF/Publications/LocalContentMay2013.pdf
[24] CCIWA, Evidence to the Economics and Industry Standing Committee, 1 November 2013

supply chains are already positioning themselves to be the providers of choice to the FLNG sector[25].

Recommendation: The WA government should review its funding of initiatives supporting local business participation in major resource projects with a view to focusing resources on initiatives that improve supplier competitiveness and capacity. The Industry Facilitation and Support Program is a positive example of such initiatives.

SKILLS DEVELOPMENT

The World Economic Forum finds that Australia earns very good marks for higher education and training, placing 15th out of 148 countries[26]. This is consistent with the recent Deloitte Access Economics report that included education as one of Australia's "fantastic five" sectors, along with gas[27]. Western Australia has a real chance to link the substantial opportunities available in gas and education and training to position the state as a global/regional research centre of excellence in areas where we have comparative strengths.

The University of Western Australia's Centre for Offshore Foundations Systems recently had two researchers recognised as Western Australia's Scientist of the Year and Early Career Scientist of the Year. In announcing the awards, the WA Premier recognised that the Centre has built a world-class research group in WA, attracting industry investment and providing practical solutions to real-world problems[28].

A further opportunity exists with the potential expansion of Challenger Institute of Technology's Australian Centre for Energy & Process Training (ACEPT). The ACEPT facility has trained around 4,000 oil and gas workers since its inception in 2008[29]. However, with new LNG projects entering the operational phase, ACEPT needs to enhance its current physical and technological infrastructure to continue to meet the skills needs of the industry.

A proposed Applied Engineering Training Centre will deliver a range of new qualifications focussing on high level technical skills including plant supervisors and managers and engineering technicians in a range of fields including mechanical, instrumentation and electronics. Co-located on the current site, the proposed new centre would double ACEPT's capacity from around 900 to 1800 graduates annually. Industry and government partners are being sought to support the

[25] See: http://www.intsok.com/index.php?categoryid=248
[26] World Economic Forum 2013, *The Global Competitiveness Report 2013–2014*
[27] Deloitte Access Economics 2013, *Positioning for prosperity? Catching the next wave*, p. 11
[28] See: http://www.mediastatements.wa.gov.au/pages/StatementDetails.aspx?listName=StatementsBarnett&StatId=7978
[29] Challenger Institute of Technology, *Waves* December 2013, p.2

expansion, which will help cement WA as the world's leading centre of LNG and FLNG operational skills. APPEA urges government and industry alike to seize this opportunity.

The Australian government is expected to announce a revitalised oil and gas industry collaboration initiative over the coming months[30]. The Collaborative Centres of Excellence will help tighten links between university and industry research and would be a new version of the previous Labor government's program of industry innovation precincts.

These examples illustrate the significant opportunities to build on existing clusters of capability and competitiveness within WA and further enhance the State's position as an international hub for the oil and gas industry.

Recommendation: APPEA encourages the WA Government to actively support initiatives aimed at attracting further investment and research excellence into the State, such as the Australian Government's foreshadowed 'Collaborative Centres of Excellence' and specifically the establishment of a potential Oil and Gas Collaborative Centre of Excellence in WA

The WA Government should support the Phase II expansion of the ACEPT facility, acknowledging the significant resource sector support of the facility, to capture the significant training opportunities available at a national and international level.

[30] Australian Financial Review, *Shell pushes for innovation*, 29 November 2013, p. 19

ATTACHMENT 1 – ENVIRONMENTAL REGULATION CASE STUDY 1

Case Study: Exploration and offshore to onshore production

Background

Most of Australia's conventional gas resources are located offshore, with significant opportunities for future developments. These developments generally involve significant and expensive exploration programs requiring seismic surveying, drilling and appraisal. Production and development takes place predominantly at offshore processing facilities with gas piped onshore.

Exploration and production activities such as seismic surveys may cross Commonwealth and state jurisdictional boundaries. A project of this type requires approval from:
NOPSEMA in accordance with the OPGGS Act;
DSEWPC in accordance with the EPBC Act; and
the state regulatory authority in accordance with the relevant petroleum legislation.

The EBPC referral and Commonwealth or state environmental plans result in duplicate information and data being modified to fit the regulators' specific responsibilities. For each submission, the proponent must then respond to often different interpretations of the information by regulators, and a range of stakeholders to address perceived issues which often do not relate to the activity.

The experiences outlined below highlight the extensive approvals and conditions required for typical offshore exploration and production activity.

Oil spill contingency planning

For offshore oil and gas projects located in Commonwealth coastal waters off Western Australia, five different Commonwealth and state bodies review and consult on one single mandatory environmental requirement.

As a part of offshore environmental approvals, Operators develop detailed Oil Spill Contingency Plans (OSCPs) for the unlikely event of an oil spill. The duplicative approval processes for these plans by five regulatory agencies is a clear burden and limits effective and clear risk planning. To approve an OSCP in Commonwealth waters, operators are generally required to consult with:

- NOPSEMA, which has legislative responsibility under the OPGGS Act to audit and accept OSCPs;
- AMSA, which has responsibility for Australia's national plan to combat pollution of the sea by oil and other substances. AMSA also reviews OSCPs for proponents that consult with AMSA on national plan arrangements;
- DSEWPC, which administers referrals under the EPBC Act. Recent conditions under the Act require operators to develop and submit OSCPs to the Environment Minister for approval;

- the Western Australian Department of Environment and Conservation which provides requirements to the offshore petroleum industry for consultation arrangements for OSCPs under the OPGGS Act. If certain criteria are triggered (generally if spill modelling reaches coastal waters), additional consultation is required; and
- the Western Australian Department of Transport and Department of Mines and Petroleum also have legislative responsibilities for coastal waters off Western Australia. In many cases, if a worst-case scenario spill activity has the potential to reach coastal waters and draw on state resources, additional review and approval is required by these departments.

ATTACHMENT 2 – ENVIRONMENTAL REGULATION CASE STUDY 2

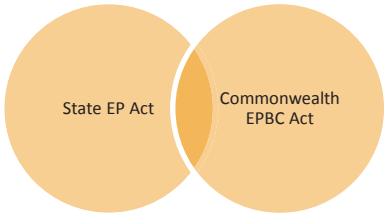
Case study: Offshore Field to Onshore Development – Gorgon Project, Chevron

Chevron is the operator for the $52 billion Gorgon Project, which has been under construction on Barrow Island since late 2009, after the Gorgon Joint Venturers received State and Commonwealth approval and made their final investment decision in September 2009. The Project will develop the Gorgon and Jansz-Io gas fields, located within the Greater Gorgon area, about 130 kilometres off the north-west coast of Western Australia. It is the largest single resource project in Australia's history.

Barrow Island is located off the Pilbara coast 85 km north-northeast of the town of Onslow and 140 km west of Karratha. The island is approximately 25 km long and 10 km wide and has been a Class A Nature Reserve since 1910. Chevron has been successfully producing crude oil from Barrow Island since 1967, while maintaining and protecting the island's conservation and biodiversity values. Barrow Island's ecology and status as a Class A Nature Reserve remains intact, largely attributable to Chevron's environmental management of the island, which has received state, national and international recognition.

The Gorgon Project is operated by an Australian subsidiary of Chevron (47.3 percent interest), in joint venture with the Australian subsidiaries of ExxonMobil (25 percent), Shell (25 percent), Osaka Gas (1.25 percent), Tokyo Gas (1 percent) and Chubu Electric Power (0.417 percent).

Case study - Overlap and duplication between State (EP Act) and Commonwealth (EPBC Act) ministerial approval processes



Common to many large projects that require State and Commonwealth environmental approvals, there are a range of challenges that arise from the complex interplay between State and Commonwealth processes. These challenges include overlapping processes and a resulting duplication of conditions and associated requirements. As experienced by the Gorgon Project, there is a difference between the State and Commonwealth approvals processes when a project requires change (i.e. a variations and or expansion of its scope) and or its management plans.

Key Issues

Unlike the WA EP Act, the EPBC Act does not enable a scope change to be approved under a single revised approval. For example, when the initial Gorgon two train (10 mtpa) LNG development was revised to a three train (15 mtpa) LNG development, this required a new EPBC Ministerial approval to be granted (EPBC Reference: 2008/4178) and the existing EPBC Ministerial approval (EPBC Reference: 2003/1294) to be revised to ensure consistency with the new approval, as the new approval could not supersede the former. In the case of the EP Act, Ministerial Statement No. 800 superseded Statement No. 748 subject to certain 'grandfathering' provisions.

Similarly, for less substantive project scope changes there is no mechanism within the EPBC Act to assess and approve these changes, unlike the EP Act's section 45c. Therefore, while a scope variation might be assessed and approved by the State, the Commonwealth has no similar means to formally 'approve' such changes. As such, without formal approval there is no 'legal defence' for the associated environmental impacts should they occur.

At the time the initial conditions were negotiated and written, the EPBC Act required a set of Commonwealth conditions that could not rely upon the State EP Act Ministerial conditions. This resulted in similar but sufficiently different State and Commonwealth conditions for separate environmental management plans to be prepared. However, as a result of the revised and expanded proposal to three trains, the Commonwealth agreed to use exactly the same conditions as those imposed by the State, with a few minor differences. While this required considerable resources to negotiate, it achieved consistency across the conditions imposed and enabled the same management plans and performance reports to be submitted to the State and Commonwealth.

As a result of the duplicated State and Commonwealth Ministerial Statement conditions, the same environmental management plans are required to be assessed and approved by different agencies/Ministers. This requires considerable resources for all parties to commit to consultation and negotiation to (preferably) generate a single plan that meets the respective needs of the various agencies. For example, notwithstanding the other agencies/stakeholders that need to be consulted, the Offshore Feed Gas Pipeline Construction Management Plan has to be assessed and approved by the Western Australian DEC, Western Australian DMP, Department of the Environment (DoE) and NOPSEMA.

There are a number of challenges that arise as a result of the above issues, including:

- It is not possible to physically or even legally separate the facilities and activities associated with, or the environmental impacts of, the two or three train developments. This is because some of the facilities and impacts between these 'actions' would be different in degree and or cumulative, so cannot be solely attributed to either action.
- Generates multiple, duplicated conditions that create overlap and repetition between instruments.
- Exposes the proponent to the potential of regulatory action under multiple instruments for the same event should there be a non-compliance with (the duplicated) requirements.
- Potential for inconsistencies between the State and Commonwealth approved project scope/description to establish for the less substantive changes.
- Poses a challenge in trying to align State and Commonwealth approvals, and the subsequent management plans and regulatory reporting requirements that flow from these approvals.
- Management plans and regulatory reports require 'approval' or 'Ministerial determination' under each of the various instruments.

Implications for the Project

The current constraints within the EPBC Act meant the Project, with its integrated Gorgon Gas Development and Jansz Feed Gas Pipeline, cannot be encompassed by a single Ministerial Statement from the Commonwealth – rather, multiple Ministerial Statements have been and will need to be issued. Coupled with the highly complicated drafting of conditions and compliance assurance requirements, this creates a challenging regulatory environment that is resource

intensive and administratively burdensome on the proponent as well as the administering agency (DoE).

The EPBC conditions for the project do not have provisions for non-substantive amendments to be made to the approved systems, plans and procedures without further approval. The requirement to prepare environmental management systems, plans and procedures for assessment by multiple agencies is resource intensive and this is exacerbated by the large number of plans required, and the need to resubmit these documents for additional review and approval each time they are amended. This is particularly the case with respect to management 'systems' as they comprise many layers of interdependent components (e.g. procedures, processes, guidelines, checklists etc), which when varied comprises a change to the system and hence requires subsequent approval. This requirement to submit highly detailed systems, plans and procedures for approval, and the review and approval of any subsequent amendments, restrict the proponent's operational flexibility, timely implementation of continuous improvement opportunities, and have the potential to create delays, uncertainty and increase project costs if not well planned and executed by the proponent well in advance of approval being required.

Opportunity for Improvement

Legislative change to the EPBC Act that enables the assessment and approval of a change to a Project scope (without the need for a new referral) and subsequent modification of an existing Ministerial Statement to accommodate the project change would be beneficial to both government and proponents.

Where there are already exhaustive State Ministerial Statement conditions of approval that adequately regulate a proponent's activities, then a legislative change to the EPBC Act that enables the cross-referencing of these conditions, for the avoidance of duplication and potential for inconsistency, would be beneficial.

Similarly, provisions either in the legislation or in the EPBC Approval Conditions that enable proponents to make non-substantive changes to, previously approved, environmental management systems, plans and procedures would also be beneficial to both government and proponents.

These changes would assist proponents by reducing risk, remove uncertainty, reducing potential schedule delays and costs; it would also assist agencies facing resource constraints.

Commonwealth and state approvals processes differ when a project changes due to variations, expanding scope or different management plans.

ATTACHMENT 3 – ESTIMATED COST IMPACTS OF DEVELOPMENT ASSESSMENT AND APPROVAL DELAYS

Offshore LNG project

Adapting previous Commission discounted cash flow methodology (PC 2009b) and utilising new data from the Australian Petroleum Production and Exploration Association (APPEA) and other sources, it is estimated that a one-year delay to a major offshore LNG project could reduce its net present value (NPV) by between $0.5 and 2.0 billion, with a central estimate of $1.1 billion (or around 9 per cent). These estimates relate to costs borne by the project proponent (from delayed profits) and the wider community (through delayed royalty and tax revenue). Delay may also result in higher financing costs and commercial risks.

These estimates were developed from an illustrative project with construction costs of $11.3 billion (within the $4.4 billion to $52 billion range for the eight oil and gas projects under construction in the September quarter of 2013 (DAE 2013)). Cash flows for the project were constructed using: output volume, and construction, operating and decommissioning cost data supplied by APPEA; and prices based on those producers are currently receiving (adjusted over time by an energy price growth assumption).

These baseline cash flows were discounted to the present day using an assumed cost of capital of 8–12 per cent per year. Delay was modelled by assuming construction commences one year later, thus all cash flows are delayed one year. The delay scenario cash flows were also discounted to the present. The cost of delay was calculated as the difference between these two NPVs.

The cost estimates are sensitive to the assumed profile of the project's income stream and the discount rate. To test the sensitivity of the estimates, both the discount rate and price assumptions were varied. Table 7.2 presents the range of estimated costs that result from this analysis.

Table 7.2 **Sensitivity analysis — simulated offshore LNG project[a]**

Change in NPV ($ million) for a one-year delay

Energy price growth[b]	*Discount rate[c]*			*IRR[d]*	*Baseline NPV[e]*
%	*12.0*	*10.0*	*8.0*	*%*	*$m*
0.0	-500	-600	-800	18	7 000
2.0	-900	-1 100	-1 300	22	12 500
4.0	-1 500	-1 800	-2 000	26	19 800
Impact on NPV (%)	*-10.7*	*-9.1*	*-7.4*		

[a] Capital investment of around $11.3 billion occurs over five years, with a subsequent 24 year effective production life. [b] Assumed annual nominal growth rate. [c] Per cent discount rate. [d] Internal rate of return. [e] Baseline NPV without delay, based on a 10 per cent discount rate.

Sources: Commission calculations based on simulated project production and cost data provided by APPEA.

These estimates are different from those in the draft report because they rely on more up to date and disaggregated cash-flow data. The new estimates also include some costs that accrue to the wider community as well as to the project proponent.

There are a range of other factors not considered in the analysis that could influence the actual cost of a delay brought about by development approval and assessment processes. For example, an increased difficulty in financing the project or reduced flexibility to respond to market conditions could push costs higher and/or threaten the viability of the project. In contrast, any ability to accommodate the delay within the planned project schedule or use the delay to improve project design could lower costs.

ATTACHMENT 4 - INDIVIDUAL OFFSHORE & MARINE SUPPORT SERVICES CONTRACTS

Supplier	Operator	Project	Works	Value $m
Worley Parsons	Hess	Equus	To undertake the contract for a deep-water semi-submersible platform.	-
Wood Group Australia	Hess	Equus	To undertake work for a subsea gas gathering system and pipeline to link to an approved or existing liquefaction pipeline.	8.1
Velocious	Chevron	Gorgon	Subsea Gas Piping Support.	5
Svitzer Australia	Chevron	Gorgon	Supply four 33m 80-tonne bollard-pull azimuthing stern drive (ASD) tugs and a 16m Pantocarere self-righting pilot boat.	-
Subsea 7	Apache	Julimar	Transportation, installation and pre-commissioning of subsea umbilicals, manifolds and diver-less tie-in spools.	100
Pressure Dynamics	Woodside, Shell, Chevron	Greater Western Flank, Prelude and Wheatstone	Various	13
Oceaneering	Apache	Julimar	To supply a 25 km long electro-hydraulic umbilical.	-
Neptune Marine Services	Eni	Blacktip	Inspection, repair and maintenance including saturation diving, air diving and remote-operated vehicle works.	6
Neptune Marine Services	Hess	Equus	Geotechnical and geophysical surveys.	14.5
Mermaid Marine	Santos	Modec	Offshore marine services.	15
Matrix Composites and Engineering	Various	Various	To provide drilling products, subsea, umbilical, riser and flow line ancillary equipment and well construction products.	48.2
Leighton	Chevroon	Wheatstone	Subsea Pipeline Micro tunnel.	60
GE	Apache	Julimar	Supply subsea equipment.	150
Fugro TSM	Woodside	North West Shelf	Responsible for project management, engineering, procurement and execution under the Great Western Flank Phase 1 subsea installation contract.	100
FMC Technologies	Woodside	Greater Western Flank	Design, manufacture and supply of subsea production systems.	150

FMC Technologies	Chevron	Wheatstone	Design, manufacture and supply of subsea production systems.	325
Clough	Chevron	Wheatstone	Design and construction of the product loading facility and tug berths.	400
Clough	Chevron	Wheatstone	Provide labour, materials and a support vessel for the offshore hook-up and commissioning component of the Wheatstone project	350
Civmec Construction & Engineering	Cameron	-	To construct subsea manifolds.	4
BAE Systems	Chevron	Wheatstone	To provide offshore satellite communications.	10
Allseas Construction Contractors	Apache	Julimar	Transportation and pipeline equipment.	500
Agility Logistics Australasia	Chevron	Gorgon	To provide logistics, stevedoring, and related services.	232
AGC Industries	Woodside	Greater Western Flank	Fabrication of post metrology subsea spools. Awarded on behalf of Subsea 7 Australia.	-
AGC Industries	Chevron	Gorgon	Fabrication of post metrology subsea spools. Awarded on behalf of Subsea 7 Australia.	-