



SECURING INVESTMENT
IN AUSTRALIA'S FUTURE

Report of the Project Costs Task Force

 **Business Council
of Australia**

About this publication

The Business Council of Australia (BCA) brings together the chief executives of more than 100 of Australia's leading companies, whose vision is for Australia to be the best place in the world in which to live, learn, work and do business.

This report, titled *Securing Investment in Australia's Future: Report of the Project Costs Task Force*, is accompanied by a paper by the BCA titled *Securing Investment in Australia's Future: Managing the Economic Transition*. Both publications draw on background research prepared for the BCA by Deloitte Access Economics titled *Investment and GDP Profile Study*. For copies of the three publications, visit www.bca.com.au

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1. Executive summary

Context

In June 2012 the Business Council of Australia (BCA) released a study *Pipeline or Pipe Dream? Securing Australia's Investment Future* that highlighted the increasingly important role that investment in major capital projects – resource projects, infrastructure projects and major commercial projects – is playing in the Australian economy. This report follows on and examines the cost of delivering major projects in Australia.

At that time the pipeline of existing and potential major capital projects was estimated to be \$921 billion. The size of the largest of these major projects was unprecedented in Australia's history up until that time: the largest single, completed project in Australia is the Pluto stage 1 LNG project, valued at \$14 billion. In March 2012, there were nine projects underway or about to commence larger than Pluto, ranging from \$15 billion to \$43 billion – by way of comparison, the cost of the Snowy River Scheme would have been only \$8 billion in today's dollars.

Critically, the same report warned that Australia was becoming a high cost environment to deliver these major projects, citing research that found resources projects are 40 per cent more expensive to deliver in Australia than comparable projects in the United States Gulf Coast, and that projects were taking too long to complete.

Following these findings the BCA formed the Project Costs Task Force in September 2012 to develop a better understanding of why Australia is a high cost country for delivering major capital projects, and what industry and government can do to constrain costs.

What the Project Costs Task Force found

The task force confirmed the key findings of the *Pipeline or Pipe Dream* study, that Australian project costs are higher than they are in other developed countries. According to BCA members and companies, drivers of high costs include:

- problems with **planning, design, scheduling and procurement** – partially caused by overly optimistic project scheduling, scarcity of suitably qualified and experienced project managers and engineers and other key occupations, which at times led to inadequate project execution
- **unpredictable and unnecessarily complex and prolonged government regulatory processes** and decisions – which compounded any pre-existing problems in the construction phase
- the **workplace relations system** which:
 - enables unions to use the agreement negotiating process to ramp up high terms and conditions as project proponents are having to meet deadlines at critical stages in the project start-up and delivery
 - limits the capacity to achieve productivity offsets to balance wage levels
 - enables unions to prevent project proponents from using contractors and other arrangements to manage workforce numbers and deployment through the different stages of a project in line with workforce demands.

Why rising costs matter

If costs become too high, companies will invest elsewhere or we will get less value for every dollar that is spent on infrastructure. And for those projects that go ahead, shareholders will receive a lower return, governments will receive reduced tax and other revenue, and communities will pay more for vital infrastructure.

Since the task force was established, we have seen the impacts of these high costs, falling commodity prices and falling demand.

Australia's economy-wide investment pipeline – constituting resources, infrastructure, industrial and major building projects – has declined by 5 per cent, from an estimated \$921 billion to \$877 billion

over the past twelve months. The fall would have been steeper were it not for an increase in the estimated cost of many of the listed projects.

The value of projects currently underway is over \$408 billion – an all time record. A further \$60 billion in committed projects are about to commence. This work will help sustain activity.

But it is the declining value of projects ‘under consideration’ – the next wave of investment – that highlights a looming gap in economic activity. Projects under consideration are now only \$159 billion; this is \$113 billion or 43 per cent lower than at the same time two years ago. Another \$250 billion in projects is listed as ‘possible’ but these are much less developed. Furthermore there is uncertainty over a number of projects currently in the planning stage. Investor caution is highlighted by \$150 billion in resources projects being deferred, revised or cancelled over the past six months.

The decline in resources investment will directly impact on GDP through a cumulative fall in real private engineering construction spending from \$98 billion to \$80 billion over the next three years, or \$39 billion. Increasing infrastructure investment will prevent a larger decline in activity, but only if a sufficient set of high quality projects can be planned and funded. Other sources of growth such as housing investment and net exports will need to lift as well.

The challenge now is for industry and government to take concrete steps to reduce the cost of delivering major projects, so that Australia continues to be an attractive destination for capital investment. To do this we need to:

- ensure the public and private projects that are currently under construction are delivered according to schedule, and to their planned cost
- take deliberate steps to secure positive investment decisions for those public and private projects that are under consideration, and remove any barriers to their timely commencement
- create a regulatory environment that encourages investment in Australia over the long term, so that a steady pipeline of capital projects can be rolled out.

What can be done about costs

Government and industry both bear responsibility for taking actions that will constrain the costs of delivering major projects and restore Australia’s competitiveness.

Australia needs to get its regulatory, workplace and skills settings right in order to avoid *big boom* and *big bust* cycles and to avoid missing opportunities from a timing perspective. The goal needs to be to get Australia’s local workforce that has worked on the most recent boom redeployed onto the next wave of projects – securing the knowledge learned from the most recent boom.

Australia needs to ensure its workplace relations system allows project owners to attain labour productivity gains on its major projects to support current wage settings.

To do this Australia’s regulatory environment must be stable and effective and our cost competitiveness, compared to the rest of the world, must be improved.

Industry actions

Industry is continuously working to capture the lessons of recent mega projects and major infrastructure projects to improve its ability for project management, engineering and execution.

Recent industry initiatives include working with the higher education sector and professional bodies to achieve:

- better oversight and governance over project plans and schedules to correct for optimism bias and narrow considerations of risk
- collaborative engagement with internal and external stakeholders including government, the workforce and the broader community

- leadership practices that communicate strategy effectively and develop the specialist skills and capabilities of individual project team members (see Exhibit 1).

Government actions

- All governments need to recognise the challenges Australia faces in delivering major projects and prioritise policy action that will reduce the costs of delivering projects and lift project productivity.
- The Commonwealth government should ensure project proponents have access to the skilled workforce that is needed to deliver major projects competitively. This means ensuring Australia remains open to skilled migration to meet peaks in demand, taking steps to remove barriers to labour mobility, support the education and training system to improve the skills of the labour force, supporting industry to train their workforce.
- All levels of government need to be guided in reforming their development assessment and approvals processes by the recommendations in the Productivity Commission's draft report on benchmarking Australia's major project approvals processes. Industry needs to constructively engage with governments to assist in this task.
- State governments need to work with industry to implement effective regional planning to help alleviate the cost impact of constructing major projects in a remote environment.
- The Commonwealth government should ensure workplace relations arrangements allow businesses to grow, innovate and manage their workforce and capital while also providing workers a fair income in conditions of freedom, equity and safety. This should be done in a way that allows more direct engagement between employers and employees to drive productivity improvements at the firm level.

Exhibit 1: Investing in education for performance in major projects

Australia needs to look hard at how it can more effectively plan and deliver major capital projects. Examining large projects in resources, construction, infrastructure and government over the last decade indicates only a few real successes. Substantial cost and time over-runs are unfortunately too common an occurrence. In an investment constrained world, Australia risks losing out as a location for future capital investment and the associated economic benefits. Also, approved projects may end up costing organisations and taxpayers a lot more than they should. These futures are not attractive. Critically, they are already manifesting.

The Business Council of Australia (BCA) report on capital project costs raises important issues that Australia has to address. Many of the BCA findings in relation to skills shortages match research conducted by the newly established John Grill Centre for Project Leadership. The Centre has spoken to CEOs, senior business and government executives and project leaders across a range of sectors. This research indicates that strong engineering skills, technical capability and project management disciplines are essential for projects, but these have to operate under effective project leadership for projects to be successful. Key messages from the Centre's consultations highlight a need for experiential education focused on:

- better oversight and governance over project plans and schedules to correct for optimism bias and narrow considerations of risk
- collaborative engagement with internal and external stakeholders including government, the workforce and the broader community
- leadership practices that communicate strategy effectively and develop the specialist skills and capabilities of individual project team members.

Addressing skills and capability gaps in relation to project leadership is something that the Centre will be part of, with efforts underway to build executive education programs that are co-designed and co-delivered with industry and government.

The BCA report is also to be commended for proposing a collaborative way forward. It is important that industry, government, and research and educational institutions work together to address technical skill shortages, project leadership capability gaps and also the more complicated policy challenges that Australia faces. Education that complements practical experience, shares lessons learned and incorporates the latest thinking in project planning and delivery is vital if Australia is to turnaround its major project performance. The time for action is now.

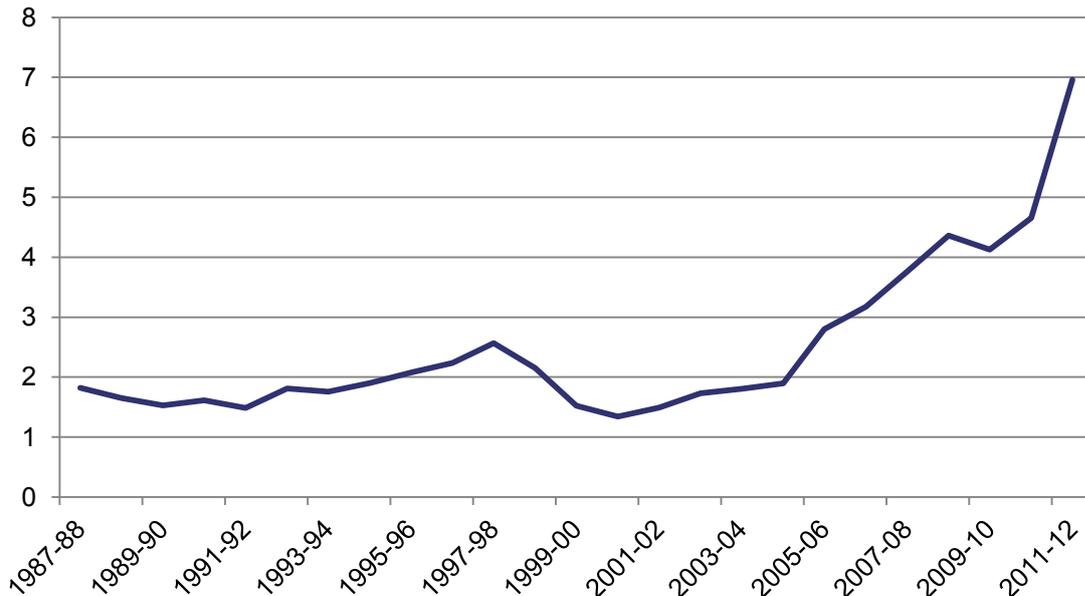
Source: John Grill, Chair, WorleyParsons and John Grill, Chair, Centre for Project Leadership Advisory Board

2. Introduction

Why this project was undertaken

Capital investment in the resources sector will peak during 2013–14 after an unprecedented boom (see Figure 1). This expansion was prompted by historically high prices for resources such as coal, iron ore and natural gas products and created large demands for labour and capital to support the construction of new resources projects and associated economic and social infrastructure.

Figure 1: Mining industry private gross fixed capital formation as a proportion of GDP



Source: ABS, cat. no. 5204, Table 52.

In June 2012, the BCA released a study – *Pipeline or Pipe Dream? Securing Australia's Investment Future* – that provided a picture of the investment pipeline, the opportunities it presents for Australia, and risks and barriers to the successful delivery of the capital projects within the pipeline.¹

Research commissioned for the *Pipeline or Pipe Dream* study² found that Australian resource projects are over 40 per cent more expensive to deliver in Australia than in the United States Gulf Coast (see Exhibit 2). The study also noted that megaprojects worldwide are found to have a 60 per cent failure rate in terms of cost or time overruns and that Australia was no exception in this regard. Additionally, the report found that the cost of delivering major construction projects – such as schools, hospitals and airports – was more expensive in Australia than in comparable jurisdictions.

Given the importance of project performance to Australia's economy, the paper also highlighted the general lack of publicly available data on project performance in Australia and very little official data to draw upon. In the absence of official data, assessing project performance needs to be sourced from private consulting firms with direct engagement in major projects and from case studies of individual projects. There is a real need for better data collection in this area. Additionally, no two projects are the same, so comparing project performance either within a country or across countries needs to make allowances for that fact. Comparing performance of projects across countries is inevitably affected over time by changes in exchange rates.

Exhibit 2: The US Gulf Coast

The Gulf Coast region in the US is commonly used by investors and cost estimators to assess resource and industrial project performance due to its market size and depth of project management and delivery capabilities. For Australia it provides a useful indicator of relative performance for project activity similar to our own portfolio.

There are marked differences between the Australian economy and that of the US Gulf Coast – which has a deeper pool of skilled labour, a mature industry and regulatory system and a generally lower cost of living. These factors, which provide favourable conditions for delivering capital projects, are difficult for Australia to emulate in the short term. However, for Australia, it provides a useful benchmark for comparison against an industry leader. It's also relevant because, in the case of the big oil and gas projects, we are going to be competing directly in the decade ahead.

In the *Pipeline or Pipe Dream* study, the BCA warned that unless action was taken to contain capital costs, and secure more efficient project delivery, capital projects would be cancelled or deferred, and that this would have major impacts for the economy and, ultimately, Australia's standard of living.

The BCA is concerned that there is not enough recognition of this problem and too little has been done to control capital costs since that time, and that the cancellation of several planned resource projects is partly a result of our failure to deal with this (see Table 1).

This report provides additional research on what is driving high capital costs in Australia and seeks to identify what can be done about these cost drivers.

Table 1: Feasibility stage projects delayed or cancelled in past 12 months (energy and resources projects)

Project	Company	Estimated Value (\$ billion)
Browse LNG	Woodside	36
Outer Harbour	BHP Billiton	30
Olympic Dam Expansion	BHP Billiton	20
Sunrise LNG	Woodside	12
Abbot Point T4-9	NQBP and partners	11
West Pilbara Iron Ore	Aquila Resources	7.4
Wandoan Coal Mine	Xstrata	6.0
Kooragang Island Coal Terminal 4	PWCS	5.0
Anketell Point Port	Fortescue/Aquila	4.0
Cape Lambert Magnetite projects	MCC Mining	3.7
Southdown Magnetite Project	Grange Resources	2.9
Yarwun Coal Terminal	Metro Coal	2.2
Mount Pleasant Coal Mine	Rio Tinto	2.0
Weld Range Iron Ore Project	Sinosteel Midwest	2.0
Balaclava Island Coal Terminal	Xstrata	1.5
Fisherman's Landing LNG	LNG Limited	1.1
Surat Basin Rail	Aurizon/Xstrata	1.0
Wilkie Creek Coal Mine	Peabody Energy	1.0
Total		149

Source: Bureau of Resources and Energy Economics, April 2013.

Why costs matter

In a globalised world where capital is mobile, Australia competes with other countries for investors' funds and project opportunities. Australia has many advantages that make us a desirable place to invest – a highly skilled workforce, a stable democracy with strong institutions and abundant natural resources. But the costs of delivering a capital project in Australia must be within reasonable bounds that allow an adequate return on investment.

Put simply, if costs become too high, companies will invest elsewhere or we will get less value for every dollar that is spent on public or private infrastructure. And for those projects that go ahead, shareholders will receive a lower return, governments will receive reduced tax and other revenue and communities will pay more for vital infrastructure.

Exhibit 3: Companies investing offshore

In September 2012, fertilizer manufacturer Incitec Pivot announced that it had suspended its feasibility study on the development of an ammonium nitrate manufacturing complex at its Kooragang Island Site in Newcastle, New South Wales. In doing so it deferred its decision on whether or not to proceed with the development for at least two years, reflecting the “anticipated reduction in demand for ammonium nitrate and the high cost of construction in Australia”.

A little over six months later, Incitec Pivot announced it would construct an US\$850 million, world scale 800,000 metric tonne per annum ammonia manufacturing plant in Louisiana, US. – an investment decision based on the US site’s “competitively-priced energy, labour productivity and responsive regulatory environment”.

Source: Incitec Pivot Ltd statements dated 17 April 2013 and 27 September 2012.

Australia must compete on cost

Costs are particularly important for the resources sector, where Australia must find ways of delivering major capital projects so that resources can be delivered to the world market at competitive prices. Australia does not have a supply monopoly on any commodity and is in competition to attract foreign investment to support the development and extraction of resources.

For example, according to BP’s statistical review of world energy, June 2013, Australia has only 2.0 per cent of the world’s proved reserves of natural gas.³ That is natural gas which geological and engineering information indicates can be recovered in the future from known reservoirs under existing economic and operating conditions. Similarly, while Australia may have the largest deposits of iron ore, these reserves account for only 20 per cent of global reserves – Brazil and the Russian Federation have similar size reserves.⁴

While caution needs to be exercised in equating reserves with share of any export market – as a country’s production does not necessarily correlate with its relative reserves and some countries may not export their resources – the fact remains that for all resource commodities Australia must compete on price.

If Australia fails to control the cost of delivering major projects the consequences will be significant. Strong terms of trade helped insulate Australia from cost pressures, but with currently declining terms of trade, higher cost structures will make some projects unviable.

The Olympic Dam expansion project, which has now been halted due to subdued commodity prices and higher capital costs,⁵ was projected to have provided:

- over 15,000 jobs in South Australia (above the business as usual case) after seven years
- an average of \$190 million per year in royalties over a 30 year period, and an increase in Australian government revenue of over \$200 million each year after seven years
- an \$18.7 billion boost to Australia’s GDP over 30 years.⁶

Similarly, Woodside petroleum has announced that the \$43 billion⁷ Browse LNG project, of which the downstream components were to be located at James Price Point in the Kimberly Region, will not proceed as originally planned.⁸ In its advice to market, Woodside noted that ‘the development would not deliver the required commercial returns to support a positive final investment decision’. This project would have created around 8,000 jobs during the construction phase and around 700 jobs during the estimated 40 years of operation (not counting additional jobs in transportation, maintenance and minor capital projects).

In fact, the Australian Bureau of Resources and Energy Economics estimates in a May 2013 report that around \$150 billion of high value projects have been delayed or cancelled since April 2012.⁹

High costs reduce the quality and amount of public infrastructure available

Governments play a major role in funding transport infrastructure, hence project cost increases will be borne by the taxpayer, either through less infrastructure, or higher cost infrastructure.

A BCA member company undertook an analysis for this report of the cost escalation from 2006 to 2012 of delivering one kilometre of a major carriageway, such as a major freeway or tollway.

The analysis found that it costs 143 per cent more per carriage way kilometre to deliver in 2012 than it did in 2006. This escalation means that a road:

- that took 27 months to complete in 2006 would now take 36 months
- that a cost of \$4.6 million per carriageway km in 2006 would now cost \$11.1 million
- that an average requirement of 57 staff per month 2006 would now be 86 staff.

How the project cost study was conducted

This study is based on interviews with BCA members' companies, government representatives and other companies involved in the construction industry and major capital projects. In addition, the BCA secretariat conducted and commissioned additional desktop research to expand upon the findings of the *Pipeline or Pipe Dream* study. All research was guided by a task force of BCA members, chaired by Tony Shepherd, President of the BCA.

The focus of the research was on seeking to understand the drivers of project costs, over which companies, industries and governments can reasonably exercise influence. The appreciation of the Australian dollar has had a major impact on the cost of delivering capital projects, however, the task force considers this to be beyond the reasonable influence of governments and industry, hence no recommendations have been made on this matter.

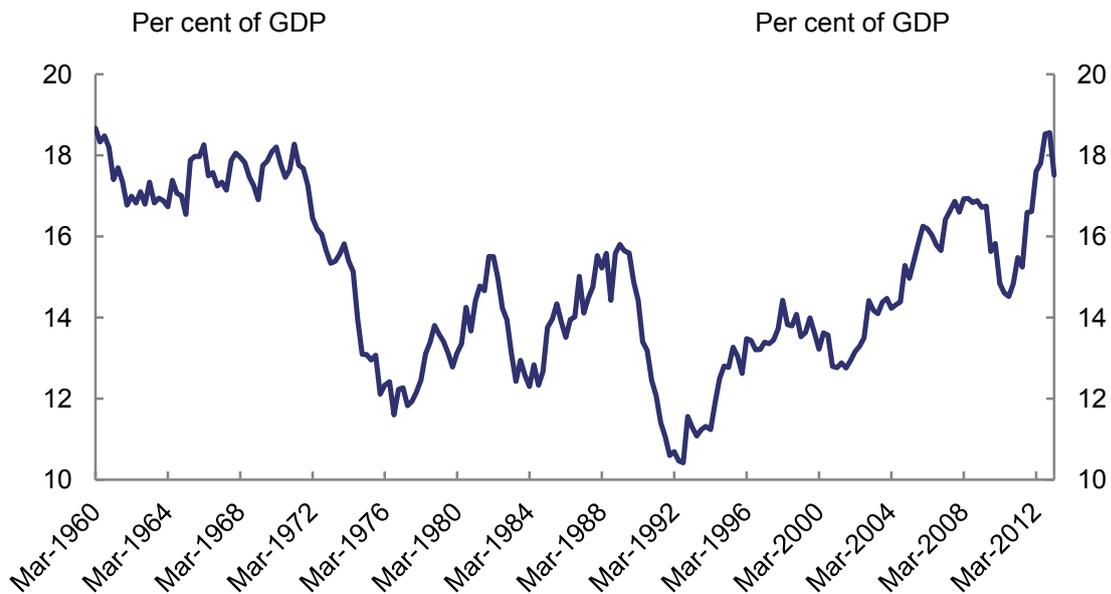
The focus of analysis is on cost drivers that are common to large capital projects. Individual companies and projects will be able to identify cost drivers (and savings) that are specific to their circumstances. Additionally, drivers of costs which are specific individual industry sectors – such as the offshore LNG sector – have not been analysed in depth in this study, except where they are relevant to overall capital project cost in Australia. Several industry specific studies are available on project costs.¹⁰ This report first outlines:

- the general context in which Australia's major capital projects have been developed and delivered over the last decade
- the drivers of costs in the resources sector, and for commercial and infrastructure projects
- recommendations on what might be done to constrain capital costs in the future.

3. Project performance and the investment boom

The rise in Australia's terms of trade over the last decade has driven an investment boom in resources and related services. This has seen new business investment as a share of GDP grow to a peak of over 18 per cent of GDP in 2012 – a level not seen since the end of the 1960s (see Figure 2).

Figure 2: New business investment as a share of GDP



Source: ABS, cat. no. 5206.

The nature and location of capital investment as a result of this boom has had a major impact on the structure of the Australian economy.

The BCA study, *Pipeline or Pipe Dream*,¹¹ noted the changing nature of investment with more 'mega' capital projects than ever before – in 2012 there were 160 projects planned, prospective or current costing over \$1 billion, with 72 already underway and with a greater proportion of these project occurring in regional and remote areas.

This increase in investment has seen a boom in construction related employment, particularly related to resource projects, which has extended well beyond those directly involved in resource extraction. For example, a recent Reserve Bank of Australia research report estimated that size of the workforce providing 'inputs' to direct resource extraction (such as suppliers of equipment and services) accounted for 6.75 per cent of total employment in 2011–12, which represents around 770,000 employees.

Through these boom conditions, Australia's productivity performance has declined and our track record of delivering major projects on time and budget has been mixed.

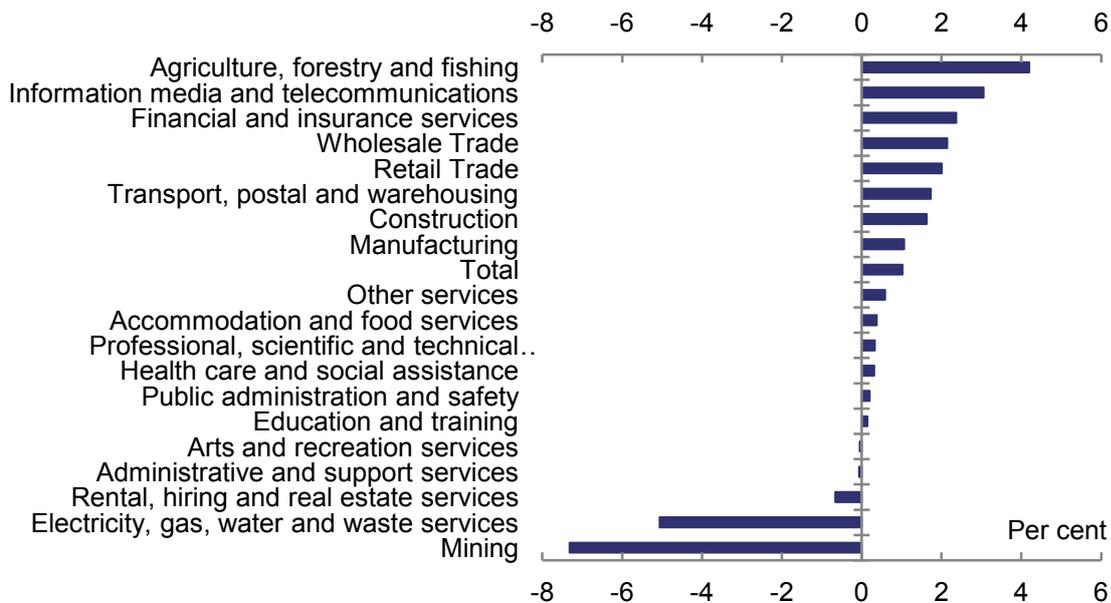
Figure 3 shows that since the start of the mining boom, labour productivity in the mining sector has decreased significantly by an average of 7.3 per cent per year since 2003–04 reflecting the gap between capital investment and construction before production commences. Declining productivity is a problem shared by many other countries when it comes to delivering major capital projects and is driven in part by the difficulty of managing costs in a high demand market and, for the resources sector, as more marginal resources are developed. But Australia's productivity performance is significantly worse than in the US Gulf Coast. Research commissioned by the BCA finds that labour productivity on resources projects is up to 35 per cent less than in the US Gulf Coast.

In the infrastructure and commercial construction sectors, which are generally not trade exposed, but are exposed to high levels of investment in the resources sector, price and productivity performance has been mixed with labour productivity growth outperforming many other sectors over the last decade.

And while infrastructure and commercial construction costs grew strongly in the lead up to the GFC, growth in prices has since moderated, possibly due to very soft market conditions outside of the resources sector.

- Prior to the GFC, construction costs were growing at between 4–8 per cent annually, since the GFC, cost growth has moderated to around 0–3 per cent annually.
- Contractor premiums in the commercial construction sector have declined to 2–4 per cent, down from 7–10 per cent in the pre-GFC era, this is because the tender competition to win work is currently tight
- Labour costs have continued to escalate at around 4–5 per cent per year, for workers covered by enterprise bargaining agreements.

Figure 3: Average sector labour productivity growth (per cent) since the start of the resources boom (2003–04 – 2011–12)



Source: ABS, cat. no. 5024, *National Accounts*, Table 15. Note: Data are gross value added per hour worked.

There remains scope to improve performance

High demand in the resources sector, and the high dollar have raised the costs of delivering Australian capital projects when compared to other developed nations.

But there is evidence that Australia’s declining productivity and rising costs are more marked than in other developed nations. For example, a recent report by the McKinsey Global Institute¹² found that the resources sector has experienced a \$5 billion decline in income as a result of lower capital productivity over the period 2005–11 that is in addition to declines attributed to the lag between investment and production and exploiting deposits that are of lower economic value.

It is the view of the companies and BCA members that were consulted as part of the research for this report that there are opportunities for the resources and construction industries, as well as governments to learn from the experiences of the first phase of the resources boom so as to improve project performance.

With investment set to play an increasing role in our economy Australia needs to get its regulatory, workplace and skills settings right in order to avoid *big boom* and *big bust* cycles or simply missing opportunities from a timing perspective. The goal needs to be to ensure that the local workforce that has worked on the most recent boom able to be redeployed on to the next wave of projects – securing the knowledge learned from the most recent boom. To do this Australia’s regulatory environment must be stable and effective and our cost competitiveness, compared to the rest of the world, must be improved.

4. Resources projects

During the development of this report it became apparent that the issues facing very large capital projects in the resources sector are manifestly different from those in other sectors. For this reason key findings relating to the costs of delivering major resource projects will be examined separately from the costs of delivering major infrastructure and commercial projects – which will be examined later in the report.

Findings on overall costs

Australian industrial projects are more expensive than their equivalents in the US Gulf Coast, according to previous research commissioned by the BCA. The cost premium is particularly large for complex processing projects (such as the downstream components of LNG projects) (see Table 2).

The estimate in Table 2 are based on a series of IPA “twinning studies” that assess overall project construction productivity at locations around the world. The study involved comparing the total construction hours used on groups of projects with similar scopes at various locations around the world. All of IPA’s cost benchmarks are prepared after adjusting to US Gulf Coast conditions in 2003, and as discussed in IPA’s paper on Australian project costs, the normalisation process masks the impact that the increases in foreign exchange rate and escalating wages have had on the cost of conducting projects in Australia since 2003.

Subsequent, research commissioned by the BCA shows that a range of projects within the resources sector were all more expensive to deliver than in the US Gulf Coast, a region commonly used by industry cost estimators as the resources sector industry benchmark.

Table 2: Summary of Australian project cost performance (without location adjustment)

Project type	Average cost compared to US Gulf Coast
Sustaining capital projects	40 per cent higher
Iron ore and coal developments	38 per cent higher
Large complex processing projects (for example, downstream components of LNG projects)	50 per cent higher

Source: Internal report for the Business Council of Australia by Independent Project Analysis, 2012. Note: Sustaining capital projects: Examples of sustaining capital projects are major capital upgrades to petrochemical facilities. Iron ore and coal developments: To produce a benchmark estimate of the cost of delivering projects which may not have actually been constructed in the US Gulf Coast (USGC), such as coal mines, Independent Project Analysis converts factor costs to those that would be experienced in the USGC, such as USGC engineering, project management, materials, major equipment and construction labour components, if such a project had been constructed in that region. The Independent Project Analysis database consists of 713 Australian projects primarily in the oil, gas and mining industries and over 16,000 projects worldwide. The projects range from less than \$1 million to over \$10 billion.

Drivers of higher costs

As expected, the task force found that there was no one single element under the control of governments, industry or individual companies that drives Australia’s relatively high construction labour and engineering costs, or the relatively poor productivity on Australian resource projects.

In fact some significant factors are beyond the influence of policy or business actions. Chief amongst these is the remote location of many resource projects as well as the appreciation of the Australian dollar against other currencies.

Notwithstanding a likely pull-back, investment in resource projects is likely to remain elevated above historic levels, and will continue to account for a significant proportion of economic activity. Hence a critical challenge is to identify the drivers of any inadequate performance in managing the office function on major projects and its relative contribution compared to other factors (such as government regulations and workplace relations) to higher construction costs.

The task force concluded that the drivers of high costs (both office costs and construction labour costs) include:

- problems with **planning, design, scheduling and procurement** – partially caused by overly optimistic project scheduling, scarcity of suitably qualified and experienced project managers and engineers and other key occupations, which at times led to inadequate project execution and late arrival of offshore prefabricated material
- **unpredictable and unnecessarily complex and prolonged government regulatory processes** and decisions – which compounded any pre-existing problems in the construction phase
- the **workplace relations system** which:
 - enables unions to use the agreement negotiating process to ramp up high terms and conditions as project proponents are having to meet deadlines at critical stages in the project start-up and delivery
 - limits the capacity to achieve productivity offsets to balance wage levels
 - enables unions to prevent project proponents from using contractors and other arrangements to manage workforce numbers and deployment through the different stages of a project in line with workforce demands.

Further, operating in remote environments, where many of Australia's very large resource projects are situated, presents many challenges in terms of constraining costs. For example, the hot climate can reduce labour productivity, and the relatively large distances that need to be covered in transit from accommodation and break areas to work sites reduces 'time on tools'. Supply chain challenges are also exacerbated by remoteness. In general, remoteness tends to exacerbate the impacts of many of the cost drivers identified above.

These costs drivers are examined in more detail in the next sections.

Those involved in the industry also noted the snowballing effect that problems emerging from the initial scoping and pre-construction phases of projects can have on the cost of construction – that is small delays, uncertainties or risks taken in the pre-construction phase can result in major cost escalations in the construction phase. This snowballing effect was seen as particularly acute for large complex resource projects.

Planning, design, scheduling and procurement

Issue

Owners and contractors associated with very large resource projects both spoke of numerous challenges with project planning, design, scheduling and procurement. These issues are particularly acute for mega projects that tend to be very complex and conducted in remote locations. Some of the key issues identified with planning, design, scheduling and procurement include:

- scarcity and, in some instances, inadequate performance of key professionals in occupations that are needed to design and supervise procurement and construction (project managers and engineers, logistics and supply chain managers, for example) as well as a shortage of some key

highly skilled trades. In some cases this has led to inadequate project management and engineering as inexperienced personnel are brought up to scratch

- overly optimistic project scheduling, which results in degradation of labour productivity as more workers are brought on site to catch up time
- changes to workplace agreements that lowered overall productivity, increased costs, plus a drift to longer working hours
- government and client regulations that made construction scheduling and execution difficult, adding to office costs, and construction labour costs.

Each of the challenges identified above has the effect of altering or delaying planned construction work, either by changing what is ultimately required to be built (in the case of design or scope changes), or by reducing the efficiency of construction (for example, where prefabricated parts do not arrive on time or need to be altered or fixed, or due to inadequate construction supervision).

Evidence

Skills shortages

The shortage of engineers, project managers, logistics and supply chain managers and skilled trades has been well documented by governments and numerous industry reports. Almost all engineering professions, including at the manager, professional and trade levels appear on the *Australian Government Skills Shortage List 2012*.¹³ The Australian National Engineering Taskforce notes that, notwithstanding high levels of short term immigration to fill engineering vacancies, vacancy rates remained at 59 per cent in 2011.

These skills shortages are starkly apparent in the oil and gas industry, as is the importance of the skill migration program in filling these shortages. A recent industry survey estimated that 49.4 per cent of the Australian oil and gas workforce (including operational work, not just capital work) was imported labour, with an average salary that is almost \$8,000 higher than local employees.¹⁴

These shortages have been particularly acute in the engineering and project management related professions, accordingly the cost of securing the services of these professionals has become very high. Engineers in West Australia have charge out rates (total costs to the employer) of ranges from \$160 up to \$220 dollars per hour on major Projects like Gorgon, Ichthys and Wheatstone. In another example, data made available to the BCA shows that a lead engineer hired for a mega project under a 457 visa would cost a company \$523,192 per year (total costs to the employer including overheads) whereas the equivalent local hire (if available) would cost \$349,312.

These rates are around 30–50 per cent higher than the standard Engineering rates in Houston for US Gulf Coast Projects.

One response to this shortage has been greater use of offshore engineering design services, which can allow companies to tap into a lower cost workforce and also run a round-the-clock design function. However, this method can present challenges when integrating the work into the final design, reducing the cost advantage, according to some of those who were consulted. The integration of a global engineering effort has been noted as a challenge across all capital project sectors, not just in the resources sector.

Indirect productivity and inadequate engineering and project management practices

Where projects experience challenges in planning, design, scheduling and procurement an increase in 'indirect costs' can be expected i.e. office costs as well as costs associated with services and labour in support of construction (such as scaffolding). Research undertaken by Independent Project Analysis (IPA), commissioned by the BCA, shows exactly these type of cost increases.

The IPA's approach to measuring productivity is to compare the amount of direct labour-days required to install a unit of material, for example, a tonne of steel or a metre of pipe. The productivity figures can be expressed as an index by comparing them against an industry norm for

the same activity. A productivity factor of 1.0 represents the installation of the material in the industry standard number of hours. For example, a productivity factor of 1.2 indicates that 20 per cent more hours are required compared the industry norm for the activity – a 20 per cent poorer productivity.

Based on this method, an number of partial productivity measures can be defined:

- direct construction productivity, which can be thought of as the number of direct construction hours taken to install a piece of pipe or a cubic metre of concrete
- indirect construction productivity covers all work required to enable the constructors actually working on the facility to do their work. Indirect labour includes construction line supervision, scaffolding, support personnel, etc.

IPA finds that 'direct' labour productivity influences on capital 'sustaining'¹⁵ projects for standard type oil refineries is equivalent or better than the US Gulf Coast, whereas 'indirect' productivity influences (which includes labour for office, engineering, rigging, scaffolding, supervision, etc) is 90 per cent poorer in Australia than the US Gulf Coast. Combined, these figures give Australia an overall productivity factor of 1.3 compared to the Gulf Coast, as quoted in the BCA *Pipeline or Pipe Dream* study.¹⁶

A key driver of this difference is difficult to determine, and cannot be automatically applied to larger scale mega projects, but contributing factors may include:

- the soundness of construction management. The USGC has a high concentration of construction activity and is able to attract and maintain a pool of experienced construction managers, first line supervisors, project controls people, etc.
- the USGC sites are usually non-unionised. Unionised sites tend to have more indirect costs due to the greater effort needed to manage workplace relations.

Further research points to similar problems on larger capital projects. IPA data shows that the average growth in estimated to actual costs for the ratios of office costs to equipment cost and construction labour costs to equipment costs for large processing projects¹⁷ (such as the downstream components of LNG plant) in Australia is much higher than in Alberta, Canada or the US Gulf Coast (see Table 3). This is important because Australian projects are generally costed using international benchmarks, hence the cost growth is reflective of higher Australian project costs.

Table 3: Cost ratios for recently complete large processing plant projects

	Office to Equipment	Bulk Materials to Equipment	Construction labour to equipment (non-modular)	Construction labour to equipment (modular)
Australia Estimate	1.3	0.8	0.8	0.4
Australia Actual	1.9	1.0	1.0	1.0
Alberta Estimate	1.0	1.2	NA	0.8
Alberta Actual	1.6	1.2	NA	1.3
USGC Estimate	0.9	0.8	0.9	NA
USGC Actual	1.0	0.8	1.0	NA

Source: Independent Project Analysis, *The Performance of Australian Industrial Projects*.

In this analysis, the costs of office work, bulk materials and construction labour are all compared to equipment cost because equipment costs are usually the most accurate components of a cost estimate. Furthermore, equipment is purchased on a world open market and the price for the same processing equipment is similar at each location. The cost ratios therefore provide an indication of how cost effectively or productively the equipment is installed at each location.

The assessment of the IPA is that the relationship between the growth in office costs and labour costs is causal, i.e. poor performance in constraining the costs of project design, detailed engineering and project management will cause construction labour costs to increase over and above the earlier cost increases.

The upshot is that Australian oil and gas companies employ more engineering and project management people to correct for early mistakes. This also led to more reworks, which partly explains why construction labour costs have been higher in Australia than elsewhere.

Data from a company involved in an onshore gas development seems to confirm that inadequate management practices are partly to blame for higher indirect costs (and subsequent escalation in construction costs). This company estimates that Australia uses many more engineers to plan and execute the same scope of work compared to the US. For example, it would typically take six total Drilling & Completions (D&C) engineers and managers to support six onshore drilling rigs that drill and complete 100 wells per year on multiple-well pads with simultaneous operations (complex planning and operations) in the US. In Australia, it takes close to 30 total D&C managers and engineers to support six drilling rigs that drill and complete 95 wells per year, most of them being operated in less complex environments.

One of the challenges Australia faces in training project managers and engineers to operate more effectively in delivering mega projects is the relatively small size of the Australian industry. According to the IPA, the relatively small number of Australian projects in the \$700 million to \$2 billion range means project professionals have little opportunity to build their project experience on midsized projects before moving onto very difficult megaprojects. This is consistent with the experience of BCA members involved in mega resource projects, noting that many contractors do not seem to have the systems, processes, management practices and personnel to move beyond about 500 personnel on site. This limits opportunities to achieve efficiencies through scale, limits competition and can complicate the construction effort – leading to higher costs.

One of the key findings of the task force was on the need for industry to engage collaboratively with all stakeholders to lift project management performance. The construction and resources sectors are already taking steps to achieve this by working with the higher education sector to improve the education available to Australia's project management professionals. It also means working with governments and unions to create a regulatory environment that supports world class project delivery.

Unpredictable and unnecessarily complex and prolonged government regulatory processes

Issue

Inefficient government approvals processes, particularly those relating to environmental and planning approvals, at the state and Commonwealth levels of government have a major impact on the cost of delivering resource projects. As noted above, delays and uncertainties in the pre-construction phase of projects, whether they be caused by government approvals or design challenges, can subsequently impact on construction costs as changes to scope and construction schedules occur.

There are four ways that government approvals increase costs above what is necessary to maintain planning and environmental outcomes. These are where approvals processes:

1. are inefficient
2. are unnecessarily duplicative between and within governments
3. introduce uncertainty into project delivery
4. are accompanied by unduly complex and prescriptive conditions.

Efficiency –The total cost of completing studies for the approvals process, such as environmental impact statements, obtaining approvals and complying with conditions can be extremely large, and it is essential that the costs of this process is commensurate with the risks and likely benefits.

Duplication – Governments need to ensure that there is no double handing in the information required of project proponents seeking to achieve the various approvals required at different levels of government and within governments. That is, the Commonwealth and state governments should not duplicate information requirements, or be seeking to regulate the same planning or environmental issues.

Certainty – Once approvals have been obtained, it is critical that project proponents are able plan and execute projects with certainty. Approvals and conditions should only be varied in the most extreme cases. Late changes to conditions on approvals can lead to changes to construction scope and schedule, which can have costly impacts on the overall construction costs. Such changes can also reduce the willingness of international companies and boards to commit capital to direct investments. Approval authorities should be more flexible and timely in addressing the inevitable variations in execution methodology, which arise in the construction of mega-projects.

Imposing conditions upon approval – conditions placed upon approvals are an essential part of the approval process. They allow the government to both intervene in the management of a project and also monitor how the project overall is implemented, and guide the development of complex projects where there is uncertainty in the final form of the project. However, conditions should not be so onerous that they make projects unviable. They must also be relevant to the environmental footprint of the project and proportional to the potential impact of the development.

It is also important to recognise that major companies take their social licence to operate very seriously and have a strong interest and incentive to prioritise sustainability in project management so as to leave a positive lasting legacy for local communities. In that regard they effectively impose conditions on themselves to ensure project management aligns with the wider communities interests and are often in a better position to identify what those conditions should be than a regulator.

The cost of excessive regulated conditions through a projects life can be a lot higher than the initial costs associated with gaining project approval.

The unnecessary costs of duplication, inefficiencies, uncertainties and onerous conditions are ultimately born by governments through reduced revenue, and by shareholders and the communities in which these projects occur.

Evidence

A recent draft Productivity Report that benchmarked Commonwealth, state and territory approvals process for major projects found that cost of delaying an average-sized Australian oil and gas extraction project, valued at \$17 billion by one year could range from \$300 million – \$1.3 billion depending on the assumptions made. The centre of this range corresponds to a reduction in net present value of around 9 per cent for the project, which would materially impact on a prospective final investment decision, potentially jeopardising the viability of the project.

Efficiency

According to research commissioned by the Minerals Council of Australia the time needed for regulatory approvals for a thermal coal mine in Australia is estimated to take 1.3 years longer in Australia compared to competitor countries.

A specific example of the costs caused by an inefficient approvals process is the National Offshore Petroleum Safety and Environmental Management Agency's (NOPSEMA) approach to conducting its assessments. Advice from members is that NOPSEMA's use of a 'sampling' approach to conducting assessments – where a proponent's environmental plan is sampled to determine its efficacy – is not sufficiently supported by guidance on what information is required in environmental plans.

The lack of adequate guidance means that the sampling process becomes iterative, which increases the costs of finalising an environmental plan. Advice from members indicates that, since NOPSEMA has been established (replacing state based regulators) the cost to prepare an Environmental Plan and supporting documents has increased from less than \$100,000 per well

prior to NOPSEMA to \$450,000–\$750,000, depending on the complexity and risk of the individual project proposal.

The costs of delays are far larger than the direct cost of preparing plans. For example, the cost of holding a non-operational offshore drilling rig (including ancillary services) can be as high as \$1 million per day. The long term risk is that operators of rigs will go elsewhere if delays become endemic to the Australian industry.

Duplication

The Australian Petroleum Production and Exploration Association reported in great detail the source and cost of duplication in the off shore oil and gas industry in its report *Cutting Green Tape: Streamlining Major Oil and Gas Project Environmental Approvals Processes in Australia*.¹⁸

An additional example can be drawn from an oil and gas operator, who in 2012 was required to obtain approvals to undertake a seismic survey of a gas field in the north west of Western Australia. This activity potentially triggered compliance with four separate pieces of legislation administered by four different government agencies at both the State (WA Department of Mines and Petroleum and the WA Environmental Protection Agency) and Commonwealth level (NOPSEMA and the Department of Sustainability Environment Water Population and Communities (SEWPaC)). The Department of Mines and Petroleum (DMP) referred the activity to the Environmental Protection Agency, who deemed that no assessment under the Environmental Protection Act (WA) was required. Three separate submissions were prepared, which, while covering similar information, required different formats and assessment processes. Approval conditions and reporting and compliance measures for the activity were applied by both SEWPaC and DMP. The operator has successfully conducted a number of seismic surveys over the last two decades, and the activity was eventually approved by all authorities.

Given the experience of the operators and of the government departments in respectively conducting and assessing these kinds of activities, it is the view of the BCA that there is scope for removing the current double handing (or in the case cited above, quadruple handling) within and between governments.

Certainty

The practical manifestation of an uncertain regulatory process was shown when Metgasco and Dart Energy – coal seam gas producers announced that they would close down Australian operations in response to regulatory uncertainty. Dart energy's 2 April 2013 media release notes of,¹⁹ "a decision to suspend field operations in Australia until there is clarity and certainty around State and Federal policies to support the industry".

The implications of this decision were spelled out by Dart Energy: "the consequence is that investment is leaving the country, field operations are being suspended, Australian jobs are being lost, and the impending energy crisis in New South Wales is not being addressed, and indeed, will only get worse. This is in direct contrast to the United Kingdom, where the government is actively seeking to support the responsible development of unconventional gas resources."

Imposing conditions upon approval

The BCA has previously cited the example of one BCA member company that completed an environmental assessment process that took more than two years, involved more than 4,000 meetings, briefings and presentations across interest groups, and resulted in a 12,000-page report. When approved, more than 1,500 conditions – 1,200 from the state and 300 from the Commonwealth – were imposed. These conditions have a further 8,000 sub-conditions attached to them. This form of duplication is potentially very much more costly than duplication in the assessment phase of environmental projects, as conditions must be applied and adhered to for the life of a project. Unnecessary conditions upon approval also increase the amount of monitoring and reporting required, all of which serves to increase costs.

The workplace relations system and the challenges of operating in a remote environment

Issue

The current workplace relations system enables unions to use the agreement negotiating process to ramp up high terms and conditions as project proponents are having to meet deadlines at critical stages in the project start-up and delivery. It also enables unions to prevent project proponents from using contractors and other arrangements to manage workforce numbers and deployment through the different stages of a project in line with workforce demands.

This has hindered efforts to improve labour productivity in order to offset very high labour costs. For the resources sector, it has exacerbated the challenges of operating in remote environments.

These are challenges that cut across management of the supply chain and widely dispersed worksites and workforce, the interaction of the project with the host region and the current workplace relations framework.

Operating in remote environments, where many of Australia's very large resource projects are situated presents many challenges in terms of constraining costs. For example, the hot climate can reduce labour productivity, and the relatively large distances that need to be covered in transit from accommodation and break areas to work sites reduces 'time on tools'.

But the current workplace relations system has been identified by some in the resources sector as an inhibitor of project manager's ability to take decisions on the management of the project, and as a barrier to direct engagement between employers and employees to resolve the operational matters that are part and parcel of working in remote environments.

For example, on some sites, at various stages during the construction phase, those consulted have noted an increase in unprotected industrial action that is in direct contravention of the order of the Fair Work Commission. And for greenfields projects, unions have been able to delay the commencement of projects (jeopardising project planning and procurement and risking very large delays and costs) while they used the bargaining process to hold out for unreasonable demands to be met.

The effect of the current arrangements for negotiating greenfields agreements is to drive up the costs of labour, which is already under pressure due to high demand for labour and the remote location of many projects, while at the same time reduce flexibility of owners and contractors to manage their workforce in order to obtain requisite improvements in labour productivity. This results in higher project costs.

These issues, which have been well canvassed in submissions to the review of the Fair Work Act are equally relevant to the wider construction industry, as will be discussed further later in this report. However, industrial disputation and delay resulting from the negotiating process on large and complex resources projects, particularly in a high demand labour market, can have a disproportionate impact on construction costs. As noted above, delays to construction schedules particularly early in the project can have a snowballing effect making the final impact disproportionately large.

Companies have also found that workers who are able to live locally and return to their homes and families are more productive overall. However, very few people are willing to re-locate with their families to remote locations, and the towns are not equipped to sustain rapid population growth. This in turn has placed cost pressures on companies as they fund the development of local social and economic infrastructure, and has raised important issues around who should fund such infrastructure.

Constructing projects in remote locations also poses unique challenges in terms of managing the supply chain – in addition to the challenge of obtaining skilled supply chain managers. The imperative to maintain the planned construction schedule means that ports and land transport links must operate efficiently and as expected. In this regard inefficiencies, high costs and industrial disputation at the Port of Fremantle were raised as a significant concern.

Evidence

Labour costs and productivity

This set of circumstances has limited the ability of project owners to offset the already high unit labour costs associated with resource projects in Australia with improvements in productivity performance.

One company that provided data for this study estimated that total labour rates (e.g. accommodation for FIFO workers) on remote Australian projects are around three times what you would see in the US Gulf Coast.

The high cost of Australian labour is born out in the Hays oil and gas global salary guide for 2013. It finds that Australian workers have the highest average annual salary of survey respondents in the oil and gas industry compared to all other countries.

Australian labour productivity performance is worse than the industry standard US Gulf Coast performance. Again one company estimated that 80 per cent additional time was required for the equivalent amount of work in the US Gulf Coast i.e. Australian labour productivity is 55 per cent of US Gulf Coast productivity.

The workplace relations system must allow project owners and operators to manage their workforce to achieve productivity gains. For example the experience of companies operating in remote areas, peak construction labour productivity occurs for a shorter working week (in terms of total hours worked) than is currently the case for FIFO arrangements which have seen a drift to longer hours as the FIFO workers seek to maximise their weekly salary. These extra hours risk putting people into “low energy mode” – in the experience of one company, peak productivity occurs for 45–50 hour week.

Greenfields agreements

BHP Billiton illustrated the challenges of negotiating greenfields agreements in its submission to the review of the Fair Work Act. BHP Billiton is a co-venturer with Esso Australia in a long standing oil and gas production venture in Bass Strait. The Kipper-Tuna and Turrum projects are current major expansion projects in this joint venture. The operator faced the difficulty that the projects require the building and then deployment of expensive and special purpose vessels and facilities, sourced outside Australia, which then had inflexible sailing schedules to Australia, easily discernible to Australian construction unions. The deployment of many other vessels and operations turned on this. The Australian construction unions took advantage of this situation to hold out for unreasonable demands for wages and the employment of favoured individuals, banking on the operator ultimately having no practical alternative but to submit.

BHP noted that this unbalanced situation which is causing huge cost blowouts and great damage to industry around Australia.

Disruptions

There is a concern that the Fair Work Act and the significant reduction in the powers of the ABCC has increased time lost to industrial action and contributed to high cost outcomes in resources, infrastructure and commercial building. The significant benefits in terms of cost and productivity of the previous regime was highlighted in a submission to the Wilcox Review – Woodside Petroleum noted the impact on the costs of constructing two similar LNG trains under differing regimes:

- LNG train 4 was largely constructed in the pre-ABCC regime
- LNG train 5 was largely constructed under the ABCC regime.

The difference in the time lost due to industrial action is striking – while LNG train 4 lost 2.3 per cent of man hours to industrial action, LNG train 5 lost only 0.4 per cent of man hours.

5. Infrastructure and commercial construction costs

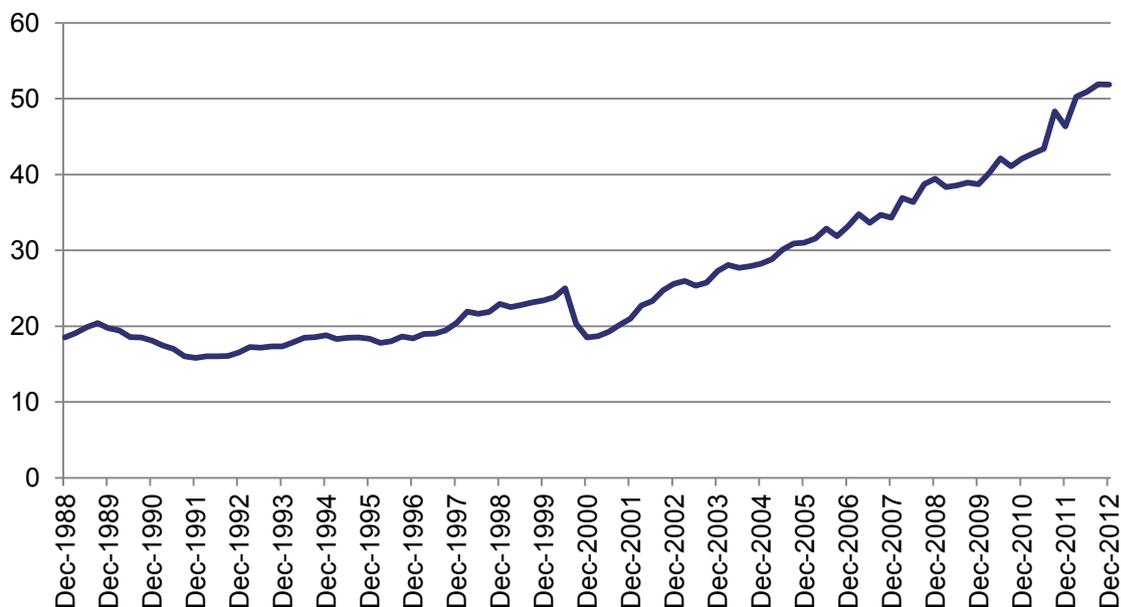
This section examines the costs associated with delivering infrastructure and commercial construction projects outside of the resources sector.

The Australian construction sector has performed well over the last decade, and now plays a central role in the Australian economy, both in terms of its size – the volume of work done and number of people employed in the sector – and its contribution to other activities as it provides the infrastructure and buildings that society and the economy need.

Value of work done in the construction sector

Since 2001 the value of construction work done has steadily increased, which has to date broken the traditionally cyclical pattern seen in the previous decades. The growth in the volume of work done has continued through recent downturns (see Figure 4).

Figure 4: Value of construction work done (\$ billion), seasonally adjusted, chain volume measures, quarterly



Source: ABS 2012, cat. no. 8755.0, *Construction Work Done*.

This trend is true of all states and territories, with Western Australia and Queensland enjoying particularly strong growth as a result of the boom in investment related to resources.

Productivity

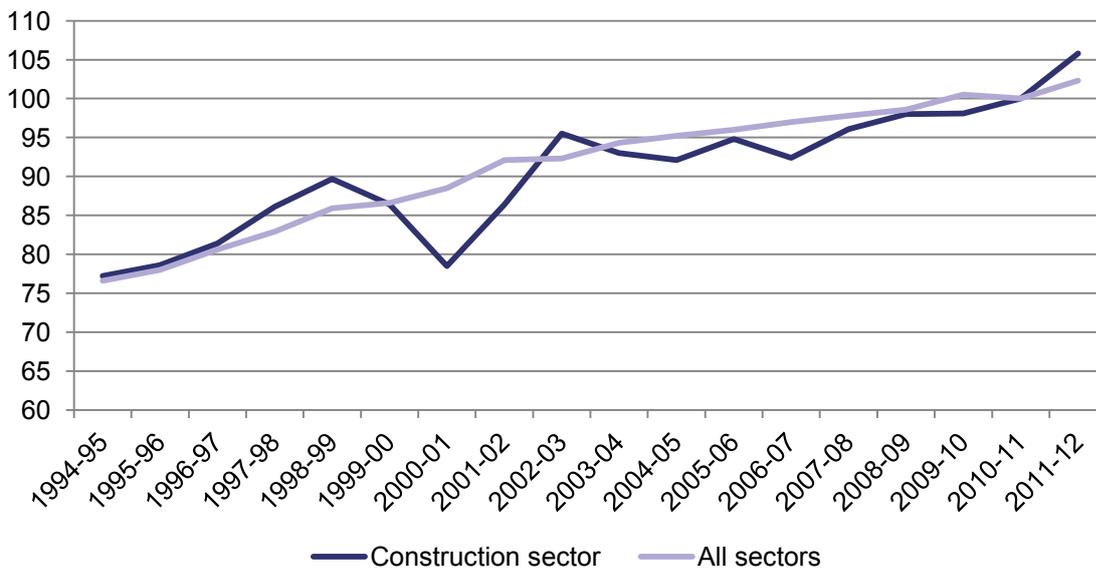
Productivity in the construction sector – both labour productivity and multifactor productivity – has grown over the last decade according to ABS figures (see Figure 5 and Figure 6). Labour productivity in the construction sector has improved on average by 1.6 per cent annually since 2003–04. Similarly, construction sector multifactor productivity growth since 2003–04, has been above that of the index for all other industries.

However, the improvement in labour productivity in the construction sector is a complicated story. The improvement coincided with a significant period of regulatory reform to the construction sector following the establishment of the Cole Royal Commission in 2001. This period saw the introduction of the Building Industry Taskforce in 2002, which preceded the establishment of the Australian Building and Construction Commission in 2005. The improvement continued throughout the investment boom in the resources sector. Task force members consider that these regulatory reforms assisted the strong improvement in productivity performance – this is also the view of other

analyses.²⁰ But given the significant structural changes in the economy that have occurred since 2002, it is not possible to say how much of the improvement can be attributed to the regulatory changes alone.

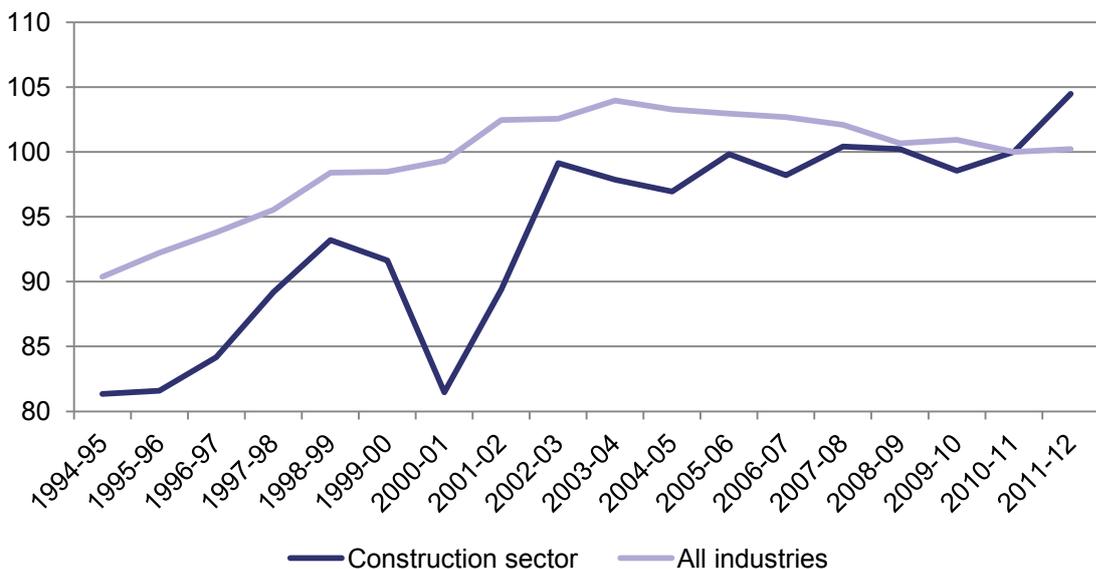
The ABS reports an improvement in labour productivity in the construction sector of 5.8 per cent over the 2011–12 year. Without further data it is not possible to determine if this sizeable improvement will be sustained, or to attribute the improvement to any one event or to a set of events. As emphasised by the Australian Bureau of Statistics and the Productivity Commission, care needs to be exercised when interpreting productivity estimates particularly on a year to year basis. Because of measurement challenges as well as its cyclical nature, productivity estimates are most useful when viewed as average growth rates between growth-cycle peaks.

Figure 5: Construction sector labour productivity index



Source: ABS, cat. no. 5204, Table 15.

Figure 6: Multifactor productivity index



Source: ABS, cat. no. 5260.0.055.002.

Costs

Estimating the growth in construction costs and how Australian projects compare to those overseas is difficult. There is a general lack of project-by-project data, and where data is available, it is difficult to compare projects – for example this study has not found any data that systematically allows one to compare the cost of building, for example, a bridge in Australia against the likely costs in other developed countries.

Additionally, much of the engineering construction work done in the last decade has been in support of resources projects. This complicates efforts to evaluate the cost and productivity performance of non-resources related infrastructure projects separately from infrastructure projects in support of the resources sector, which as noted previously is subject to very different market conditions.

Summary data from the ABS demonstrates that growth in infrastructure and commercial costs grew at 4–8 per cent per years prior to the GFC, but has been subdued since (see Figures 7–10). Recent performance likely reflects soft conditions in the non-resource states and general reduced demand in the residential, commercial and infrastructure construction sectors.

Similarly, growth in construction industry revenue and profit margins has moderated in line with costs (see Figure 8). This is consistent with research commissioned by the BCA that suggests that, since the GFC, contractor premiums have declined to 2–4 per cent, down from 7–10 per cent prior to 2008.²¹

Research commissioned by the BCA indicates that the costs of delivering commercial projects (high rise commercial and residential buildings) and key economic infrastructure (roads, for example) has risen strongly since 2003. In this regard, over the last decade, Australia has lost its relative cost advantage, compared to other developed countries.

When built to the same specification, commercial building projects in Sydney cost 25 per cent more to deliver than in London or Houston, for example. Similarly, Australian roads cost about 12 per cent more per square meter to deliver than in the UK, and are built to a lower standard.²²

Figure 7: New dwellings

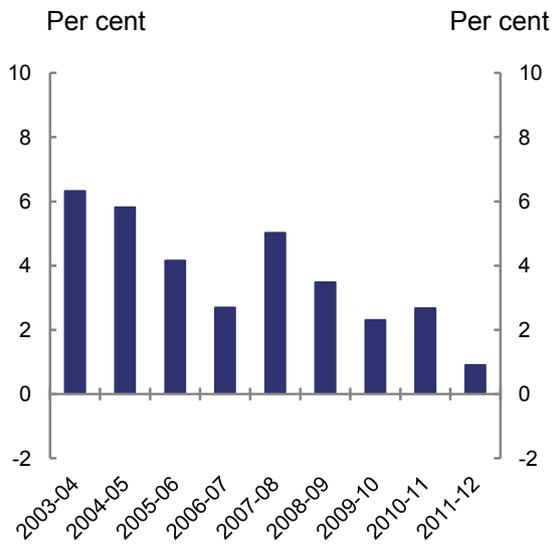


Figure 8: Non-dwelling new building

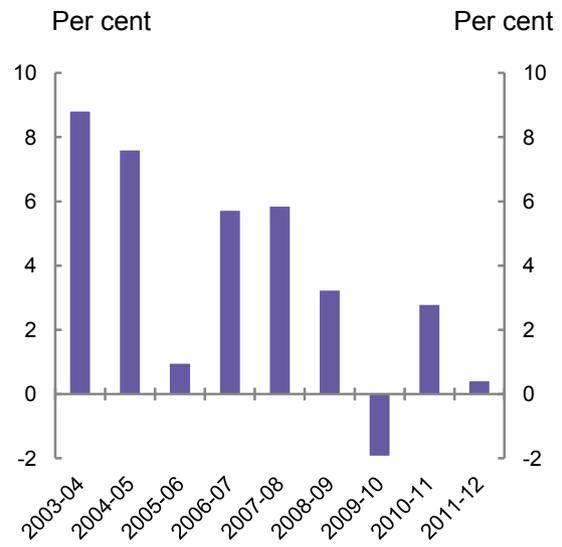


Figure 9: Engineering construction

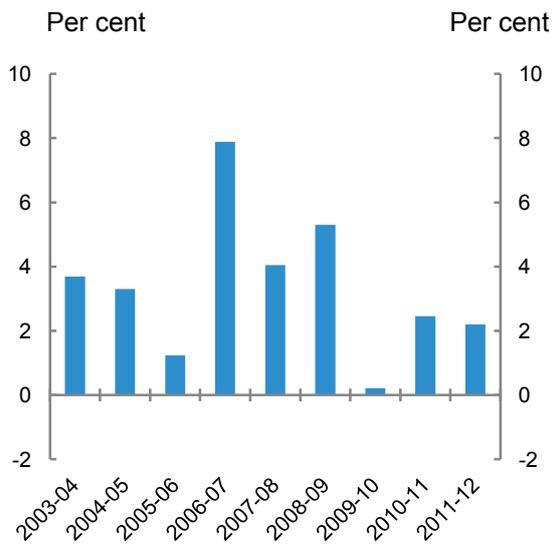
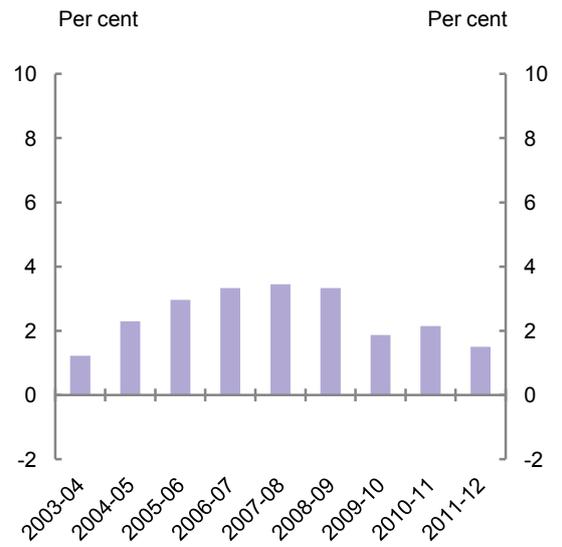
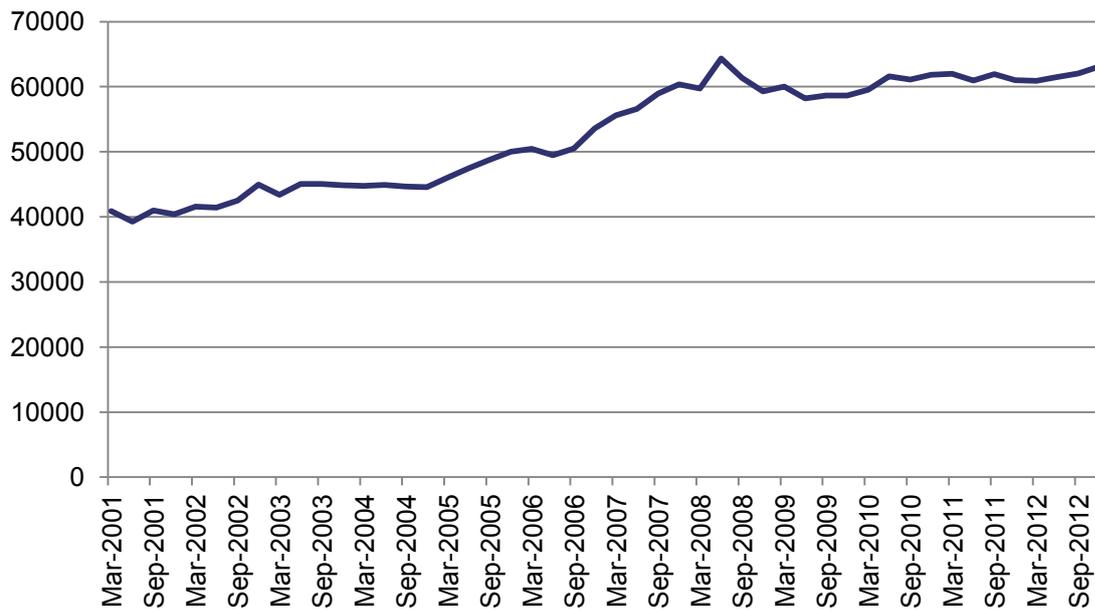


Figure 10: Final demand



Source: ABS, cat. no. 5026, *Implicit Price Deflators For Construction*.

Figure 11: Construction sector sales (\$m) seasonally adjusted, chain volume measure

Source: ABS, cat. no. 5676.0, Table 4, *Business Indicators, Australia*.

While data on overall costs have proved difficult to quantify, significant cost pressures and drivers identified during the course of this study include (in priority order):

- the **workplace relations system** that has not offset increases in labour costs with productivity improvements
- high **materials costs and the client–contractor relationship**, particularly the where the client is a government (including planning approvals).

These issues are examined in the following sections.

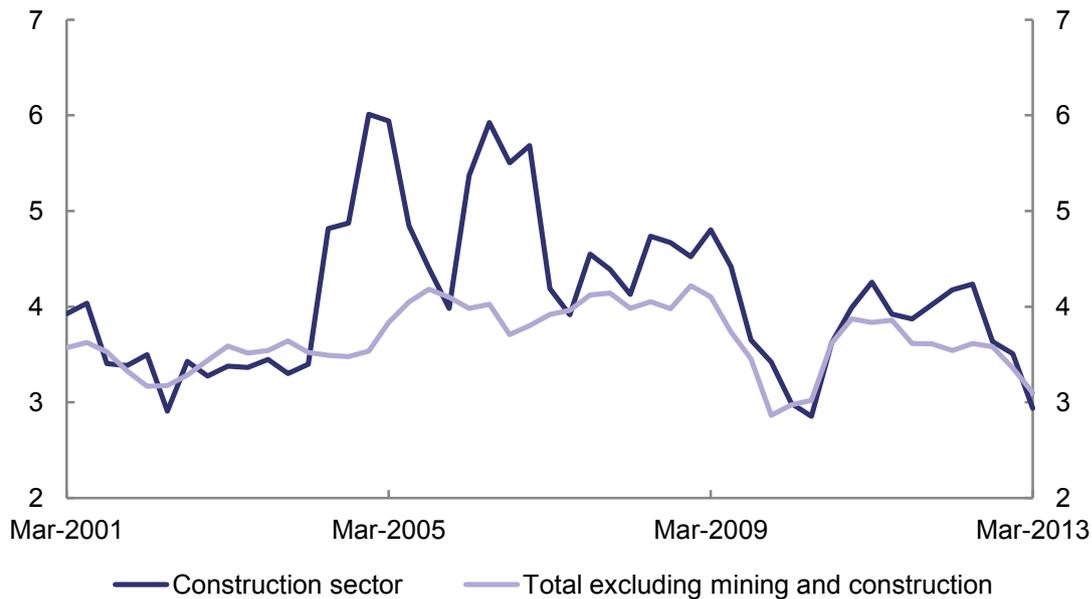
The workplace relations system

Issue

While the rate of increase in construction costs evident prior to the GFC has abated, and margins have come down, those consulted expressed concern about continued rises in labour costs.

The ABS shows that average weekly earnings in the Australian construction industry has grown strongly over the last decade. And that growth has been higher than experienced in other labour intensive industries such as manufacturing and transport, such that AWE in construction is significantly higher than in these industries, in spite of it being lower prior to 2001.

The ABS wage price index, which attempts to correct for changes in the number of hours worked and the type of work done, also shows, with very few exceptions, construction (and mining) sector wages rising faster than the remaining sectors over the last decade (see Figure 9).

Figure 12: Wage price index

Source: ABS, cat. no. 6345.0, *Wage Price Index*.

Australian construction wages under enterprise bargaining agreements (EBAs) are increasing at 4–5 per cent per year, compared to 1.5 per cent and 3 per cent in the US and UK respectively. The GFC – according to research commissioned by the BCA and data from the Department of Education Employment and Workplace Relations. The growth in Australian construction sector wages is faster than the growth in construction prices and growth in labour productivity.

The current workplace relations system was identified by the task force as a key inhibitor to productivity improvements to offset wage cost growth.

Those consulted expressed the view that the changed workplace relations environment, including the Fair Work Act, the weakening of the ABCC, and the watering down of the Commonwealth Construction Code as well as some key EBA's that set new benchmarks, are key contributors to costs. For example, EBAs now have provisions requiring that all sub-contractors receive the same conditions as those workers covered by EBAs (regardless of whether the subcontractors are covered by the EBA).

Many of the same agreements restrict efforts of project managers to improve labour productivity or maintain the construction schedule should work fall behind – for example by employing additional subcontractors at short notice. Such provisions tend to reduce competition by acting as a disincentive to new employers from entering the sector as they cannot compete on wages.

While it is very difficult to quantify the impact on cost from these types of clauses, some estimates have put the additional margin on projects as high as 20–50 per cent.

There is also a concern that the workplace relations environment has recently worsened, and that this was leading to increased disputation and days lost to industrial action.

Evidence

Workplace relations

Australian labour rates (skilled and unskilled) are now higher than those in the UK and parts of the US, and approaching those of New York (see Table 4), which is regarded as one of the most expensive cities in which to undertake construction project.²³

Table 4: Labour rates

Labour rate (AUD/hr)	Australia EBA	Australia sub-contractor	UK	Houston straight time	New York Straight time
Labourer	75	38	21.9	24.2	89.5
Plumber	95	68	53.1	41.1	148.4
Carpenter	82	57	50.9	40.0	115.8
Electrician	95	68	53.1	36.8	133.7
HVAC fitter	85	64	51.8	41.1	197.9
Foreman	150	100	68.9	50.5	156.8

Source: Turner and Townsend, International Construction Cost Comparisons, 2013.

Table 4 shows hourly charge out rates for Australia, the UK and US (converted to Australian dollars at A\$1=US\$0.95, A\$1=£0.61) for trades that are commonly used in commercial construction. Charge out rates are the prices charged by the head contractor or sub-contractor, rather than the take home wage of the worker. The rates include the base wage, taxes and benefits as well as overheads (plant, admin, etc.) and profit margins.

The rates shown in Table 4 are sourced from Turner and Townsend via research commissioned by the BCA. They are typical for a Tier 1 contractor using union labour (EBA columns) or a mid-tier contractor using smaller subcontractors, and are reflective of rates paid for commercial construction in Australia's east coast capital cities. The ability of a head contractor to utilise smaller subcontract labour on a major commercial project will be determined by the details of relevant EBAs to which the contractor is party and the suitability of available subcontractors to work on the construction site.

Charge out rates for construction labour on resource projects or commercial construction in other parts of Australia can be expected to differ from those shown in Table 2. These projects and jurisdiction are governed by their own agreements and market dynamics. As demonstrated in the previous sections, charge out rates for construction work for resource related projects can be expected to be substantially higher than those shown in Table 2.

The charge out rates for the UK, Houston and New York were sourced via Turner and Townsend's global offices.

While a large part of this differential can be explained by the appreciation of the Australian dollar – which makes Australia rates appear higher when US and UK rates are expressed in Australian dollars. However, Australian EBA labour rates would still be 50 per cent higher than those in the UK were the Australian dollar to return to its average for the last decade.

Several factors potentially help explain the differences in cost between the EBA and non-EBA categories. Subcontractors with EBA labour working with Tier 1 contractors are often highly specialised, and carry high overheads, training costs, and provide transport, plant and equipment. Furthermore the market may be undersupplied with suitably qualified tradespersons, with high competition from the resources sector which causes charge out rates and wages to increase.

However, the differential between the Australian EBA and non-EBA wage rates particularly for less skilled trades may indicate that Australia's workplace relations system plays a part in driving costs – as evidenced by the fact that EBA ordinary time charge out rate for a labour is about 98 per cent higher than for a non-EBA subcontractor.

Labour productivity must be higher for those covered by an EBA in order to sustain such a large differential between those contractors not on an EBA, but the workplace relations system restricts project managers ability to drive labour productivity improvements.

Workplace relations limits to productivity improvements

As noted earlier in this report, a 2012 analysis²⁴ noted the positive correlation between improvements in productivity in the construction industry and construction industry reforms that commenced with the establishment of the Building Industry Taskforce in 2002. The analysis found that productivity in the non-residential construction sector had increased by at least 10 per cent over the subsequent decade, whereas it had been flat in the preceding years. However, the numerous changes in workplace relations laws, regulation and compliance regimes make it difficult to determine cause and effect.

While the impact on costs is difficult to quantify, it is becoming increasingly clear the ability of project managers to drive improvements in labour productivity is being reduced under the current workplace relations framework. The view of the task force is that this has had a material impact on costs.

Specific examples of provisions that reduce the ability of project managers to drive labour productivity can be derived from Enterprise Bargaining Agreements covering electrical trades in Victoria.²⁵ Examples of provisions that require union consultation or agreement – rather than direct engagement between employers and employees – that restrict efforts to lift productivity include :

- varying cycle, hours of work and start/finish times
- rosters and varying shift arrangements
- individual flexibility arrangements – generally
- apprentice ratios
- engagement of contractors.

They potentially prevent employers from introducing major changes to production, program, organisation, structure, or technology in order to lift productivity.

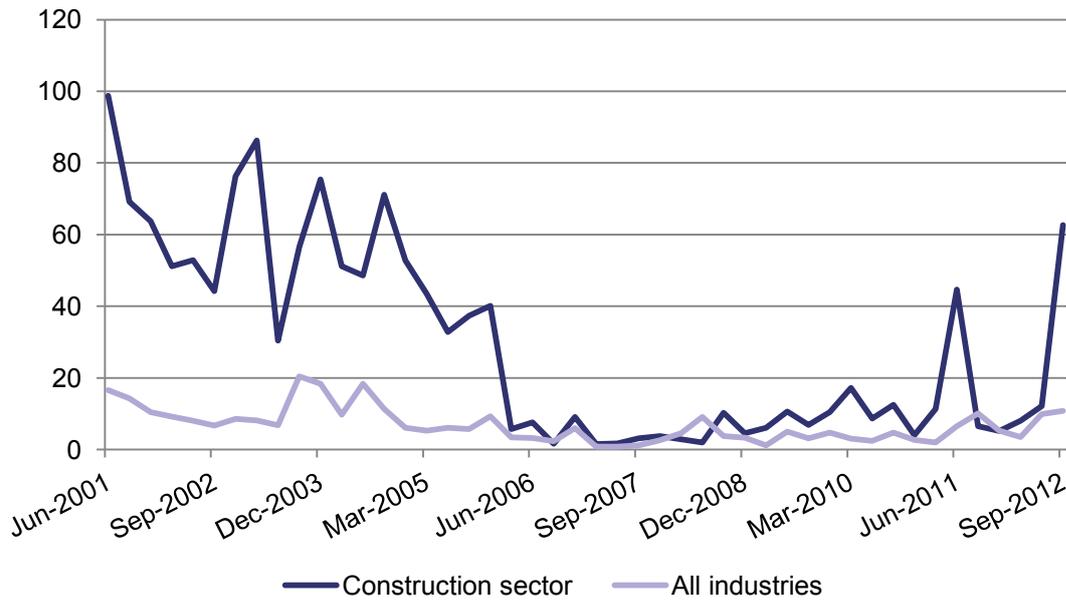
Provisions that require agreement between management and unions, such as these, that are unrelated to pay and conditions, can lead to costly compromise, delay, and deals concerning unrelated matters. Similarly, provisions that require '*consultation*' quickly lead to industrial dispute if agreement cannot be reached – and are thus functionally equivalent to an '*agree*' clause.

It is difficult to quantify the cost impact of such clauses, other than to say that projects in Victoria, where these types of onerous agreements apply more widely, can cost 20 to 50 per cent more, according to one company involved in numerous commercial and industrial projects around Australia. The task force considers that for these issues, there should be a requirement to inform (within reasonable time) rather than *consult* or *agree* with unions.

Industrial dispute

The task force is also concerned with a recent up-tick in days lost to industrial action, and that this up-tick may indicate the start of a trend. Industrial dispute is at a lower level than the decades prior to 2000, and particularly so since 2005. However, a recent upturn may signal a worsening of the workplace relations environment (see Figure 10).

Figure 13: Days lost per 1000 employees



Source: ABS, cat. no. 6321.0.55.001

If this recent up-tick becomes part of a long term trend the costs to the construction industry and the wider community will be significant. Research commissioned by the BCA highlights the costs associated with industrial action (see Exhibit 4).

While industrial unrest has always been a concern, the construction sector now accounts for a greater share of the economy compared to a decade ago, which means that any increase in days lost in that sector will have a proportionately greater impact.

Exhibit 4: The cost of industrial action – Grocon

Overview

On 20 August 2012, CFMEU members picketed sites of construction firm Grocon in Melbourne, Brisbane and Sydney. The Grocon dispute went on for 16 days. The basis of these disputes was the CFMEU claim that Grocon refused to allow externally appointed safety representatives, nominated by the CFMEU, access to Grocon's construction sites.

In all, about \$3 billion worth of Grocon projects were under threat from union action. Some of the affected Grocon sites in Victoria were:

- Myer Emporium site at Lonsdale Street (contract price for the project: \$1.16 billion)
- the Victorian Comprehensive Cancer Centre in Parkville where the Grocon Group of companies is party to a contract for its development (contract price for the project: about \$1 billion)
- the McNab site in Footscray (contract price for the project: \$80 million)
- the Westpac site at 150 Collins Street, Melbourne (contract price for the project: \$114.8 million).

Unlike other disputes, this dispute was not characterised by any order being made by FWA against the Victorian CFMEU. Rather than accept FWA-sponsored mediation, Grocon was successful in the Victorian Supreme Court in having an injunction imposed against the CFMEU. This injunction ordered the CFMEU to cease the picket at Grocon's Melbourne CBD worksite. The injunction was ignored by the union, and Grocon is now pursuing contempt action.

The hearing of the contempt claim lodged by Grocon against the CFMEU is currently underway in the Victorian Supreme Court. In addition, Fair Work Building and Construction commenced on 8 October 2012 civil action in the Federal Court against the CFMEU and certain affiliated individuals, the charge being unlawful industrial action involving coercion.

Cost of industrial action

While there are no 'official' estimates of the costs of the dispute, the following figures published in the media give an indication of the possible costs.

This dispute is estimated to have cost Grocon more than \$370,000 a day just in the site in Melbourne's Lonsdale Street. Grocon is seeking \$10.5 million in lost revenue to be recovered from Victorian CFMEU.

The cost to the tax payer, incurred primarily by the hefty police presence, is estimated at \$500,000 each day of the dispute.

Source: Allen Consulting Group, research commissioned by the BCA

Materials costs and relationship with government

Issue

Commissioned research and consultations suggest that materials costs are higher on Australian infrastructure and commercial projects than in the UK and US and parts of Europe. Much of this high cost is associated with the appreciation of the dollar, but is also affected by the relationship between the client (which is often a government or government agency) and the contractor.

One major company involved in constructing roads in Australia and the US noted that the approach taken by governments in facilitating projects can be a significant cost factor. This company noted the benefits of risk sharing and innovative procurement methods to keep materials costs down. Additionally, there was a view that a more facilitative approach could be adopted by Australian

governments to the relocation of key utilities during the construction phase of economic infrastructure.

A related issues is that of state government requirements that add to costs. Examples include excessive design life requirements, which increase the costs of materials or community add-ons, such as bike paths along new roads.

Evidence

Materials costs

The cost (in US dollars) of common building materials in Australia, the UK and US is outlined in Table 5. The table indicates that for common building materials Australian prices are all higher than UK or US prices, and in some cases substantially so.

Table 5: The cost of common building material in Australia, the UK and the US

Price in USD (current exchange rates)		Aust	UK	US
Concrete	Per m3	145	136	142
Reinforcement Bar	Per tonne	1250	1220	1044
Concrete block	Per 1000	3224	1495	1084
Plasterboard	Per m2	12	8	3
Paint	Per litre	13	3	8

Source: Turner and Townsend, *International Construction Cost Comparison, 2013*.

The high costs of these materials can largely be attributed to the appreciation of the Australian dollar, however, even at historical exchange rates some of these materials are still more costly. This remaining differential may be attributed to the relatively small size of the Australian market and our higher cost structure (as detailed in this report) compared to the UK and US, and potentially to price discrimination from global suppliers.

The client-contractor relationship (including standards and approvals)

A BCA member company undertook an analysis for this report of the cost escalation from 2006 to 2012 of delivering one kilometre of a major carriageway, such as a major freeway or tollway.

The analysis outlines the impacts of legislation and regulatory impacts on projects and labour and input cost shifts over the period. The comparison was undertaken on the average of the same road distances and in similar topographies. It assumes a CPI increase of 17.5 per cent over the period.

The analysis found that it costs 143 per cent more per carriage way kilometre on a constant dollar basis to deliver in 2012. This escalation means that a road:

- that took 27 months to complete in 2006 would now take 36 months
- that a cost of \$4.6 million per carriageway km in 2006 would now cost \$11 million
- that an average requirement of 57 staff per month in 2006 would now be 86 staff per month.

The key drivers of this increase are detailed in Table 6.

Table 6: Growth in costs centres for delivery of a major carriageway

Cost category	Cost escalation (2006–2012)
Design	+150%
Environment and approval staff	+145%
Onsite environmental costs, excluding staff	+180%
Labour	+40%
Fuel	+25%
Cement	+33%
Aggregate	+30%
Asphalt	+40%
Precast elements	+80%
Plant hire	+25%
Rebar supply	+30%

Clearly, those categories that are impacted upon by government design specifications and environmental and planning regulations – design, environment and approval staff, and onsite environmental costs – have increase significantly. This indicates that there are opportunities to constrain costs by examining the costs versus the benefits of some design standards and environmental and user amenity requirements and the way in which governments interact with contractors.

Other cost categories, such as labour and materials have increased at a rate far above inflation or productivity improvements, consistent with the analysis outlined earlier in this report.

Design life and user amenity

The impact of increasing government requirements for design life and user amenity can be seen on the recently completed Brisbane Airport Link.

Exhibit 5: Brisbane Airport Link

Changing design life and user amenity standards in Australia can also increase the cost of delivering major infrastructure projects. For example, it is estimated that the cost of the Brisbane Airport Link tunnels may have been 5–10 per cent less if they were constructed to design and amenity standards which applied 25 years ago.

For a tunnel such as Airport Link, the design life issue can manifest itself in increased requirements for waterproofing, permanent support systems, corrosion protection, fire resistance, flood proofing, material specifications, etc.

User amenity and safety now adds new requirements such as lifts in escape tunnels, smoke ducts, heightened air quality limits, breakdown lanes, security, traffic management and emergency systems including fire controls. The safety systems demanded by the government for Airport Link tunnels are at the extreme top end by world standards.

Source: BCA Project Costs Task force.

High standards for safety and amenity are unquestionably required in Australia, however, there may be merit in governments working with contractors to adopt a more judicious approach to identifying if the marginal benefits of adopting a higher standard outweigh the costs, which at times can be significant.

6. Recommendations and directions for change

With investment set to play an increasing role in our economy Australia needs to get its regulatory, workplace and skills settings right in order to avoid *big boom* and *big bust* cycles. The goal needs to be to get Australia's local workforce that has worked on the most recent boom on to a well managed next wave of projects – securing the knowledge learned from the most recent boom. To do this Australia's regulatory environment must be stable and effective and our cost competitiveness, compared to the rest of the world, must be improved.

Four key areas were identified for reform in order to reduce Australian costs to remain globally competitive:

1. improving access to a skilled workforce
2. improving government approvals processes
3. a workplace relations environment that is focussed on productivity
4. alleviating impacts of remoteness.

In each area, there are actions that can be taken at the industry level – by relevant companies acting collaboratively – and at each level of government. As noted earlier in the report, individual companies will also be able to identify a number of actions that will reduce costs and improve productivity.

Improving access to a skilled workforce

Findings

The capital project investment boom has led to unprecedented demand for project managers, engineers and other skilled professionals, as well as skilled trades.

To meet this demand companies have had to rely on overseas professionals and trades people, and professionals who previously had no direct experience in the mining and oil and gas sectors.

Demand for these skills has inflated the cost of labour. And efforts to train professionals from other sectors may have contributed to poor indirect productivity and increased costs in the construction phase.

A flexible, cost effective skilled migration program will remain an essential element in meeting peaks in demand for skill labour.

Reforms

Australia must ensure its migration and immigration settings allow companies to meet the cyclical demands for labour generated by mega projects. This demand for labour cannot be met by increased domestic training or retraining alone – attempts to develop a domestic workforce to handle an investment peak would be economically inefficient and socially irresponsible as it would result in poor skills utilisation and underemployment in times of more moderate demand. It is more efficient and economical to bring in skilled workers and manager to meet peak demand and then return them when demand falls to a level which can be met by local supply.

A flexible and efficient temporary skilled migration program must be put in place.

Notwithstanding that there will remain a need for skilled temporary migration, the size and nature of the investment pipeline means that Australia must train more quality project, managers, planners and engineers.

Industry, governments and unions all have a role in this regard:

1. The Commonwealth and state governments need to work together to better measure the forward investment pipeline and capture data on the costs of delivering public infrastructure projects. Such a task could be overseen by the Bureau of Infrastructure, Transport and

Regional Economics, and would be complementary to the role of the Bureau of Resource and Energy Economic in collecting resources and energy related data.

2. The Commonwealth government should ensure project proponents have access to the skilled workforce that is needed to deliver major projects competitively. This means ensuring Australia remains open to skilled migration to meet peaks in demand, taking steps to remove barriers to labour mobility, support the education and training system to improve the skills of the labour force, supporting industry to train their workforce.
3. The construction and resources sectors should take steps to support the development of centres of excellence to capture the engineering and project management lessons from the first phase of the resources boom. This could be done in partnership with the John Grill Centre for Project Leadership at the University of Sydney. The focus should be on:
 - 3.1 better oversight and governance over project plans and schedules to correct for optimism bias and narrow considerations of risk
 - 3.2 collaborative engagement with internal and external stakeholders including government, the workforce and the broader community
 - 3.3 leadership practices that communicate strategy effectively and develop the specialist skills and capabilities of individual project team members.
4. The Commonwealth Government should implement the National Science, Technology, Engineering and Mathematics (STEM) Strategy called for by the Chief Scientist of Australia. This will enable a whole-of-government approach to coordinating STEM policies, prioritising public investment and adopting an incentive structure that encourages growth in business investment.
5. All governments and relevant agencies should use future workforce estimates to better target training and migration programs to alleviate skills shortages.

Improving government approvals processes

Findings

The planning and environmental approvals processes associated with major capital projects has increased costs, delays and uncertainty. This has materially impacted on the cost competitiveness of Australian capital projects and has caused the deferment of investment at the cost of jobs and productivity. The direction of recent government reforms concerning environmental approvals has been to further increase the costs to business with no improvement in environmental outcomes.

Reforms

The efficiency and effectiveness of environmental regulation in Australia can be improved without cost to the environment by shifting the Commonwealth Government's role away from assessing and approving individual projects to one of strategic and regional assessment/management and systems stewardship.

1. The quality of regulation making should be lifted by making the preparation of Regulation Impact Statements a statutory requirement for all new regulations with a significant impact, with exemptions strictly limited to issues of national security and emergency.

Environmental regulation

2. The Commonwealth should negotiate bilateral agreements under the Environment Protection and Biodiversity Conservation Act to accredit state government environmental approvals, initially for low-risk, low-impact projects in environmentally well understood areas.
3. The EPBC Act should be amended to remove the 'water resources' trigger as this directly duplicates existing processes for no environmental gain.

4. The Commonwealth should accelerate strategic environmental assessments in areas where major developments and projects are likely to occur. These assessments should provide for subsequent developments to be deemed complying developments having been tested against a set of criteria established in the strategic assessment.

Major project approvals

5. COAG should reform development assessment systems by removing duplication between the Commonwealth and states (including through bilateral agreements for states to approve proposals under the Environment Protection and Biodiversity Conservation Act, initially for low-risk, low-impact proposals in environmentally well-understood areas), establish single-approvals authorities and move to deemed approvals for complying developments.
6. The federal government should make productivity payments conditional on states agreeing to reform their development assessment and approval processes to make greater use of zoning and complying development, consistent with long-term integrated strategic plans. It should systematically measure the cost of multiple regulatory approvals processes on individual projects and report publicly.
7. State governments should adopt improved best practice arrangements for assessment of major economic, infrastructure and resource projects. This includes a single agency to deal with major project approvals and removing the concurrence powers of other state government agencies.
8. State governments should:
 - 8.1 undertake regional planning (as well as capital city planning) and in collaboration with the Commonwealth and local governments, where appropriate, to identify major land uses and associated infrastructure requirements
 - 8.2 use planning instruments which allow all policy matters to be brought forward into rezoning decisions, and which provide for subsequent developments to be deemed complying development and tested against a set of performance standards
 - 8.3 reserve areas for designated activity as part of strategic planning and where possible deem permissible activity as complying, for example, resources exploration.

A workplace relations environment that is focussed on productivity

Findings

Workplace relations laws have resulted in greenfields projects being delayed and costs driven up without commensurate improvements in labour productivity. Further, the Fair Work Act has resulted in a differential between the cost of labour under union EBAs and non-union subcontractors that cannot be sustained without improvements in labour productivity.

The scope of matters that can be included in EBAs has reduced project managers ability to take decisions to lift productivity and manage costs. This has reduced the flexibility required to deliver projects on time and within budget.

Reforms

The Fair Work Act should be reformed to create the institutional, policy and regulatory environment in which businesses can respond effectively to competitive pressures. These settings will largely apply across the economy. Settings will need to foster productivity through:

- supporting direct engagement between employers and employees at the enterprise level
- creating an environment that reduces unnecessary uncertainty and risk
- giving managers full discretion over management issues
- creating incentives for collaboration and minimising industrial conflict
- delivering fair remuneration outcomes that reward effort

- promoting healthy and safe workplaces.
1. Specifically, the Fair Work Act should be amended to:
 - 1.1 ensure good faith bargaining and provides access to employer-only greenfield agreements
 - 1.2 reduce the scope for adverse actions with the aim of removing opportunities for vexatious claims
 - 1.3 limit access to protected action where there has been unreasonable or capricious use of access to protected action
 - 1.4 make illegal clauses which exclude the engagement of contractors or labour hire companies
 - 1.5 modify the 'better overall outcome test' to provide for a broadening of scope of what is included in the test
 - 1.6 improve the capacity for the use of individual flexibility agreements
 - 1.7 modify clauses in relation to majority support determinations to ensure they are on the basis of secret ballot, open to both employers and employee bargaining representatives and provide for ballots during protracted bargaining periods.
 2. There should be no return to compulsory arbitration – the Fair Work Act should include capacity for the head contractor facing excessive demands to seek the review of the proposed agreement by the Fair Work Commission against a set of criteria including the relevant award, national employment standards and better off overall test. Subject to the agreement meeting these criteria the commission should then have the power to issue a greenfields determination for the duration of the project.
 3. Any provisions relating to rights of entry should be redrafted to reflect the arrangements that were previously in place ie: a union has a right to enter a workplace where:
 - 3.1 the union is covered by an enterprise agreement that covers the site or be attempting to reach one
 - 3.2 the union can demonstrate that it has members on that site
 - 3.3 those members have requested the union's presence.
 4. The building and construction sector benefited from the previous regulatory environment prior to the abolition of the Australian Building and Construction Commission (ABCC). The benefits of this regulatory environment need to be restored by reintroducing the ABCC.
 5. The Productivity Commission should be tasked to conduct a wide-ranging inquiry into the best form for modern workplace relations regulation in order to improve competitiveness and productivity without compromising worker pay and conditions. An interim report making recommendations on the most pressing workplace relations issues should be provided within three months.
 6. The Commonwealth should ensure that the same behavioural standards apply to all parties in each workplace negotiation – employers, employees, managers and unions by inviting the ACTU to consider developing a voluntary code of conduct for its members.

Alleviating impacts of remoteness

Findings

The remote environment in which many major capital projects are being constructed increase the cost base and exacerbate other drivers of cost – such as a shortage of skilled professionals. While only limited policy options are available to governments in this regard, there are measures that could be pursued:

Reforms

All governments need to ensure their development policies and infrastructure priorities support the 'normalisation', to the greatest extent possible, of the economic and social infrastructure of remote regions that will experience sustained capital investment

1. State governments should establish special development authorities for regional growth areas to expedite land approvals and the development of social and economic infrastructure.
2. Regional development plans around major resource projects should be carried out by state governments, including provision of housing and economic and social infrastructure. Special development zones should be established to expedite approvals of land use.
3. All governments should support efforts to increase geographic mobility by:
 - 3.1 nationally recognising trade licences regardless of the jurisdiction in which they are obtained
 - 3.2 reducing or removing transactional taxes on property transfer (house sale) in favour of less distortionary tax bases
 - 3.3 working towards a common school starting age and national curriculum
 - 3.4 maintaining policy settings that minimise costs to employers who have staff on fly-in/fly-out work arrangement
4. The Commonwealth and states should review the efficiency and suitability of current transport links from ports through to major capital projects in remote regions.
5. Commonwealth and state governments must make improving the efficiency of ports and airports a priority.

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