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The Train Builders Union

AMWU

REFORMS TO SAVE OUR PUBLIC TRANSPORT RAIL MANUFACTURING SECTOR

August 2016

Contents

FOREWORD

The Australian Manufacturing Workers' Union is proud to be Australia's rail building union. We support a rail manufacturing and maintenance industry employing almost 20,000 people and representing $1.75 billion per year in national income. Thousands in the industry choose to be our members.

Australia is experiencing renewed demand for public transport. Governments nationwide are planning to spend over $46 billion on rail public transport projects within a decade, including billions on new rolling stock.

The AMWU wants to ensure that this sector can give our local manufacturers and their employees the maximum possible number of productive and sustainable jobs. Unfortunately, across Australia, each State still 'does its own thing' in designing and ordering its public transport rolling stock. This lack of national consistency in procurement, design and standards is creating vast inefficiencies for local manufacturers. This undermines local jobs. Without action, this fragmented approach could see the loss of our local industry altogether before long.

National reform in this sector will yield great efficiencies and deliver a strong local manufacturing future. This report examines the challenges and outlines practical reform – it seeks to bring all political leaders together to work towards 'economies' of scale in rolling stock procurement, design and volume of orders for local manufacturers.

Economic modelling reveals adopting reforms would yield between 550 and almost 700 full-time Australian manufacturing jobs and add between $4.2 and 5 billion to our economy over a decade. It could even establish a sizeable export industry for Australian-made rolling stock.

Securing a bright future need not cost money – just a sincere commitment to national microeconomic reform. This report provides that reform direction so that our governments can deliver jobs and prosperity for Australian manufacturing workers.

Paul Bastian
National Secretary
Australian Manufacturing Workers' Union

August 2016

Executive summary

- Viewed from a national perspective, Australia's State-based public transport rail manufacturing sector is fragmented, inefficient and overdue for reform. Economic modelling of plausible reform gains suggests results over a decade of:
  - 547 to 659 more full-time manufacturing jobs (avg. annual employment)
  - Added GDP contribution of $4.2 to $5 billion
  - Between $6.6 and $8 billion in added gross output of the sector
  - In addition, the development of a rolling stock export industry worth between $3.8 and $4.6 billion warrants further analysis.
- These gains are only likely to arrive through a political resolve to pursue genuine microeconomic reform of the State-based public transport rail sectors. This involves taking a national view, rather than allowing substantially fragmented, less-than-fully-coordinated arrangements to endure.
- An effective national approach does not involve a Commonwealth takeover, but can be a collaborative effort between leaders of the Federation to bring a single point of national accountability and standardisation in decision making to the sector, so the sector can perform at an efficient scale to generate maximum Australian jobs and offer best value to taxpayers and public transport users. Promises to 'harmonise' the sector under current State-based arrangements have failed to deliver such outcomes.
- It is a key role of the Commonwealth to pursue standardisation in transport. There are productive national reform precedents to consider in the national reforms to rail freight in the 1990s. Public transport is different from national rail freight reform, but the principle of standardising fragmented and expensive State-based manufacturing sectors is relevant. Doing so would be of national significance.
- Taking a genuinely national approach to rail manufacturing also allows Australia a strong, large-scale platform from which to make effective strategic decisions about transport infrastructure projects and about questions of local labour content in the manufacturing sector, in the national interest.

Recommendations

The AMWU seeks to promote high-quality, sustainable Australian manufacturing jobs in rail, more profitable, competitive and sustainable local industry participants and an industry which considers and acts on strategic local content in the national interest, linked to other manufacturing sectors. Based on this report, it endorses the following recommendations:

Recommendation 1: **Gain a comprehensive sense of problem and opportunity**

Commission a market-led inquiry on the real benefits of national reform

The Prime Minister and Premiers should agree to complement the analysis offered in this AMWU report with local manufacturers' views: a market–led examination of costs to the local rolling stock manufacturing industry incurred by maintaining multiple State–based planning, design and procurement arrangements should be commissioned. This should encourage all local manufacturers, suppliers, organised labour and rail operators to develop case studies quantifying the costs and risks of the current system. The process should model the benefits of moving to a national approach with a single source of national standards and accountability for all of these matters. Transport agencies should provide assistance to this examination as required. The process should be chaired by an international authority in this field. The process should report directly to the Prime Minister and Premiers with its findings and reform recommendations.

Recommendation 2: **Implement a proven national rail reform structure**

Begin planning a national public transport authority

The Prime Minister and Premiers should examine the merits of establishing a national public transport authority where all States and Commonwealth are equity shareholders in a common structure that minimises the fragmentation of the sector and offers maximum opportunities for volume of orders, certainty and innovation for local manufacturers, suppliers and their employees. The national rail freight reforms are a useful template.

Recommendation 3: **Use the reformed structure to drive better labour strategies**

Consider strategic manufacturing content in the national interest

A national structure must give active consideration to the long–term local manufacturing content requirements that might be in the national interest to retain in this sector.

Context, focus and approach

In 2015, the AMWU resolved to develop a high–quality economic policy position on public transport rail manufacturing which would form the centrepiece of a national campaign to fight for reform and jobs in the sector, in line with AMWU efforts in the Defence industry. Respected figures in transport economic policy and modelling Juturna/Cadence Economics were engaged to develop economic modelling, policy analysis and reform proposals in this respect.

In March 2016, the Australian Senate's Rural and Regional Affairs and Transport Committee announced an inquiry into the rail industry. The following report is designed to clarify the real challenges, identify productive reform paths, quantify the benefits on offer from prosecuting these reforms and present recommendations for achieving this objective.

Public transport rail construction and maintenance is the focus

The report has limited itself to public transport rail procurement, manufacturing and maintenance matters, rather than freight matters. This is because in terms of efficient reform opportunities, freight rail manufacturing and maintenance is inherently more advanced than public transport, given that freight on rail has already been the subject of important national reforms, in particular under the Keating Government in the early 1990s, as part of the *One Nation* transport policy reforms[i].

In contrast to Australia's national rail freight management and control arrangements, public transport rail arrangements remain highly fragmented. There are five Australian State governments with public transport rail manufacturing sectors: New South Wales, Victoria, Queensland, South Australia and Western Australia (in addition, the Australian Capital Territory is considering development of a light rail transit capability). Each government has sovereignty over these operations. There is no particular requirement for commonality or standardisation in public transport rail procurement, manufacturing, maintenance, nor is there any nationwide view available of how rail building and maintenance choices should interface with major public transport infrastructure projects for best effect and least cost.

In these respects, the public transport aspects of rail are at risk to the inefficiencies brought about by lack of maximum volume in manufacturing disparate fleets, lack of alignment in State design, strategy and procurement and lack of homogeneity in vehicle design and accreditation, etc. All of these aspects add significantly to costs, promote unpredictable production schedules and ultimately threaten manufacturing jobs and sector productivity overall.

IN BRIEF

What was the '*One Nation*' transport policy?

The 'One Nation' transport policy was introduced by the Keating Government and ran between 1991 and 1996. In its totality it was a broad-based reform package for reform[ii], but it had distinct transport aspects of relevance to the current public transport rolling stock manufacturing inefficiencies: The 'One Nation' rail policy was developed in part as an economic stimulus package aimed at spending on rail freight infrastructure, but the higher policy objectives dealt with the Commonwealth playing a standardising role in the Federation in regard to transport matters. 'One Nation' saw many standard gauge national rail freight additions which linked ports and cities which had until this point been stranded from national rail freight Most notable of these additions was the construction of a standard gauge rail link between Melbourne and Adelaide.

In addition, 'One Nation' oversaw the implementation of a national rail freight corporation, in which the Prime Minister and several Premiers were equity shareholders, which took over disparate State-based interstate rail freight operations and provided for more efficient national freight outcomes. While the infrastructure projects undertaken by 'One Nation' were important, the more significant legacy of this policy is as a leading example of the Commonwealth and States working in partnership to attain national productivity goals in transport efficiency[iii].

Approach

This report includes a thorough literature review, including comparator reforms and metrics from overseas, where deemed relevant. Interviews were also conducted with senior managers at three Australian public transport rolling stock manufacturers.

In order to provide credible and internally consistent analysis of economic gains from reforming public transport rail manufacturing and maintenance, dynamic economic modelling of the sector was conducted. This work involved the construction of a dynamic computable general equilibrium model of the national public transport rail construction and maintenance sector and the wider national economy. Shocks have been passed through the model to simulate the impacts of plausible levels of productivity gains in the sector based on detailed industry consultation. This modelling approach does not appear to have been applied to the sector before. It offers a credible and internally-consistent basis for considering how practical and targeted reforms to the sector can yield more local jobs, a more stable and productive local industry and even a growing export industry, alongside very substantial economic gains.

The *Modelling methodology*, results chapter (page 15) details likely productivity gains and key input assumptions, while an appendix details the methodological approach to the modelling. The model itself is available for scrutiny as required at the discretion of the AMWU.

Offering structural reform solutions, not just identifying the problem

As detailed below, credible labour and economic gains on offer from a more productive industry are impressive, but they will not be achieved without a commitment to decisive reform: as it stands, much of the inefficiency in the sector can be attributed to the fragmentation and sub-economic scale of the State public transport (PT) rail sectors, their lack of commonality and the additional costs and risks that this poses for a viable local manufacturing sector. The status quo has not overcome such inefficiencies to date, 115 years after Federation.

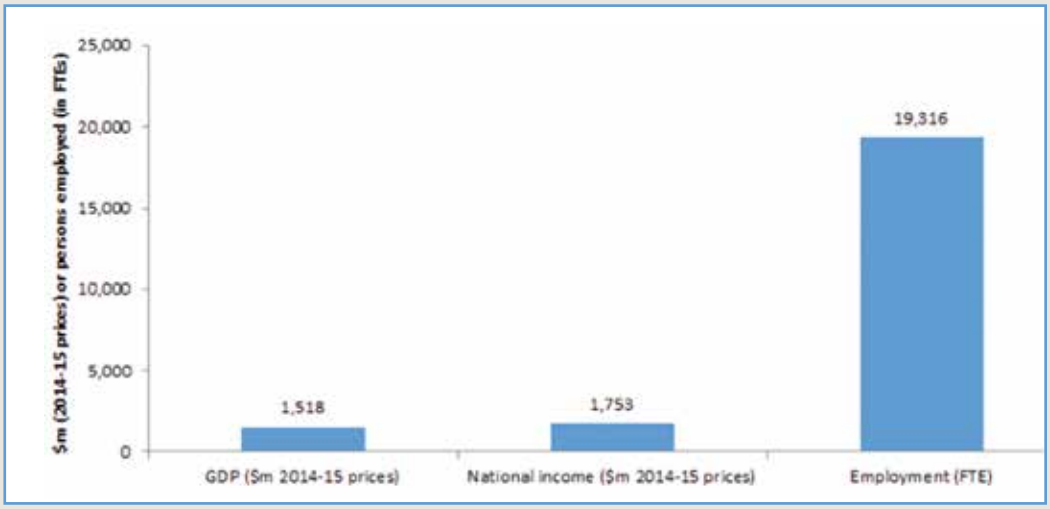
Accordingly, this report dedicates some time to considering the specific 'architectural arrangements' that stand the best chance of harvesting the modelled productivity gains. These views are provided with reference to examples in the UK and European Union, where standardisation efforts have resulted in a less-fragmented public transport rail network. These are also relevant to past national reforms in Australian rail freight, which dealt directly with issues of standardisation.

The industry and its growth prospects

The industry today

Rail manufacturing is a significant industry. The modelling for this submission undertook a shutdown scenario of the sector (see *Modelling methodology, results*, page 15) to gauge its realistic scale and economic contribution to the nation:

TABLE 1. **Contribution of the rolling stock industry to the Australian economy 2015–16**



Demand for public sector rail stock is in a growth phase

In its 2013 report for the Australasian Rail Association[iv], Deloitte found that State governments would purchase approximately $30 billion of public transport rail rolling stock between them over the 30 years to 2043 – this would reflect rolling stock demand which would grow from around 4,000 cars nationwide in 2013 to almost 11,000 cars by 2043. This activity would be concentrated in metropolitan areas such as Auburn, Newport and Dandenong but also in regional centres such as Ballarat, Bendigo VIC, Newcastle NSW and Maryborough QLD.

Since this report, the appetite for public transport rail projects has only increased. The market for public transport in rail is experiencing significant growth, as Australia – already one of the world's more urbanised countries, measured *per capita* – continues to pursue more urbanisation. The growth in public transport recognises the economic reality that cities should be major drivers of the national economy and that public transport has a significant role to play in facilitating efficient labour movement in cities. A recent study noted that the central business districts of Sydney and Melbourne – just 7.1 square kilometres in total area – accounted for almost 10% of all economic activity in Australia[v]: even minor gains in these fields can bring major benefits to the economy and quality of life.

When light rail projects are included, there has been over $46 billion committed or planned for rail-based public transport

projects in Australia in just the next decade, including many billions for rolling stock:

TABLE 2. **Major budgeted/planned PT rail/light rail projects to 2026**

State	Project Title	Project Stage	Project cost
NSW	Sydney Metro North West	Due to open 2019	$8.3 billion
NSW	Sydney Metro Project - Stage 2	Tender process has started to build the new twin Sydney Metro tunnels under Sydney Harbour and through the CBD for Stage 2 of Sydney Metro Expected to open from 2024	$6 billion
NSW	CBD and South East Light Rail	Construction underway	$2.2 billion
NSW	Newcastle Light Rail	Laing O'Rourke has commenced work as part of the design and construct contract for the Wickham Transport Interchange	$2.1 billion (State Government funded)
NSW	Parramatta Light Rail	Community consultation	$1 billion committed to explore options
NSW	New InterCity Fleet (NIF) Project Rolling Stock	Tender closed	$2.8 billion (State Government funded)
QLD	Gold Coast Light Rail - Stage 2	Awarded - design and construction commencing in mid-2016	$420 million construction contract (QLD Govt investing $270 million)
QLD	Cross River Rail	QLD Government establishing a Statutory Authority to deliver project	Estimated at $5.2 billion
ACT	Capital Metro Light Rail Project	Preferred Consortia – Construction to begin in 2016	$698 million
WA	Forrestfield-Airport Link Project	Preferred Joint Venture - Construction will begin in 2016 with the first trains running on the line in 2020	$2 billion (State Government funded)
VIC	New trains / trams	Live Tender	The 2015-16 and 2016-7 State budget combined included a $3.1 billion investment in new trains and 20 new E class trams for the network. Life extension of B Class trams in existing fleet. $1.3 billion for 65 new, high-capacity metropolitan trains with a minimum 50% local content requirement. New maintenance depot to maintain the HCMT. $257 million for 21 new VLocity regional carriages to be built at Dandenong. 27 additional New Vlocity trains for regional services (on top of the 21 above). New regional maintenance depot, Waurn Ponds Geelong. 10 new X'Trapolis trains to be built in Ballarat. $75 million to extend the life of more than 70 Comeng trains in the existing metropolitan fleet. Melbourne Metro Rail Project - Enabling Works.
VIC	Melbourne Metro Rail Project - Enabling Works	Melbourne Metro is being assessed through an Environment Effects Statement (EES) process. The project was funded in the 2016-17 budget Construction timeline 2018-2026	Melbourne Metro Project was funded in the 2016-17 budget. Construction timeline 2018-2026. Estimated at $10.9 billion Implementation of a Victorian Rolling Stock procurement division within State Government.
VIC	Regional rail	Regional rail upgrades	$1.3 billion for regional rail upgrades and infrastructure in 2016-17 budget.

Source: *Australasian Rail Association as at May 2016*

Will public transport demand be met efficiently or not?

The previous table of planned investments is impressive, but it is concerning that each of the State customers are administering considerably separate and distinct arrangements for procurement, planning design and manufacture of rolling stock across these projects.

Public transport policy is concerned with making major city economies work more efficiently and comfortably for the inhabitants. But one of the world's most respected urban transport economists, Professor Remy Prud'homme, has noted that:

'The greater productive efficiency of larger cities, however, is only potential. It is conditional upon the appropriate management of urban areas and particularly on the efficiency of the transport system' [vi].

Part of the way that governments can manage their major city transport more efficiently is by drawing upon a larger-scale, more homogenous and thereby more efficient national rail manufacturing industry, rather than the current fragmented State-based sectors. This permits a much more efficient common approach to rolling stock design, procurement and manufacturing. In turn, it promotes a far more competitive and sustainable local rail manufacturing sector.

Where do inefficiencies occur?

The following three broad categories of inefficiency are proposed:

1. Fragmented and prescriptive design, procurement and componentry selection processes.

2. Turbulent, unpredictable demand for orders.

3. Lack of benchmarks, common standards, decision-making data and tools.

1. Fragmented and prescriptive design, procurement and componentry selection processes

Australia's States are not required to coordinate or benchmark their procurement efforts. This affects many aspects of industry and procurement efficiency: potential clashes in timing of tendering obligations, complexities in design and build, volume of orders and how this might impact on a longer-term, national pipeline for wagon builds, the ability to maintain a standing workforce and tooling lines. Naturally, all of these inefficiencies affect value for money to consumers who are ultimately taxpayers.

The initial demand analysis and business case development for new rolling stock procurements is always an important juncture where choices around designs and standards will dictate componentry, cost and the impacts on potential overall efficiency. In 2011, UK train manufacturers, via the UK Rail Association, advised that the design phase represented around 8% on average of overall project cost, while decisions to select bespoke wagons with distinct componentry would add significantly more cost again[vii]. Another UK rolling stock report from the same year found that around 5% of costs would be saved simply by governments avoiding the temptation to change their policy and investment plans during the procurement process, leading to longer lead times and costlier tendering[viii]. The Deloitte-ARA report in 2013 found that 50% of total project costs are committed by the time governments complete the approvals, tendering and design phase.[ix]

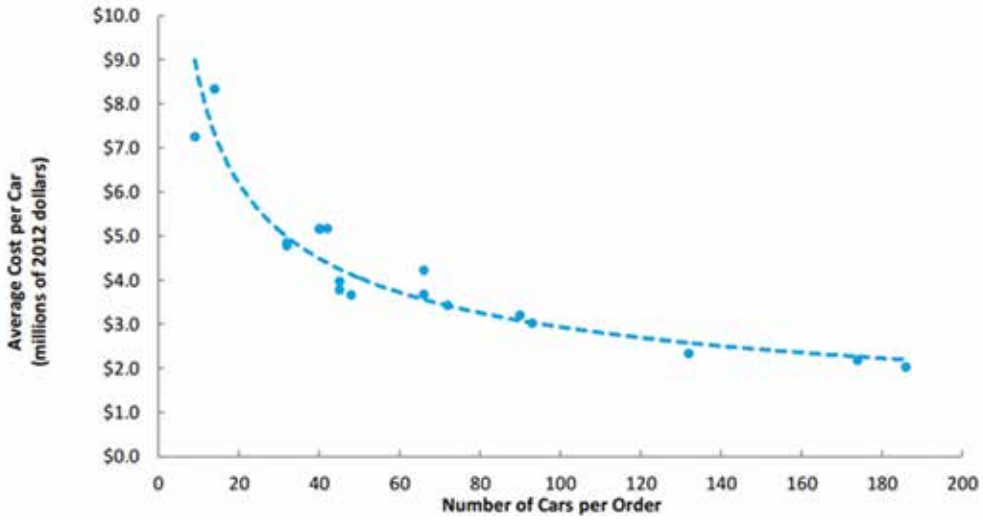
In 2014, Australia's Productivity Commission was clear that the early decisions of governments on planning, design and procurement require attention:

'building a credible and efficient government and institutional framework for project selection is a critical and urgent task for governments'[x]

When viewed from a national perspective, the design phase of rolling stock projects involves a very considerable degree of fragmentation in procurement choices. The Deloitte-ARA report in late 2013 identified 36 different types of trains in the 'Australian' public transit fleet. In addition, loading gauges – the outer dimensions of the trains which dictate how these vehicles interact with tunnels, platforms and overhead wires, etc – are far from consistent: a recent review of the Australian public transport market found that there were over 27 different loading gauge arrangements across the different State public transport rail networks[xi]. Maintaining different wagons can create non-recurrent costs that are extremely damaging to both taxpayers and domestic manufacturers: the latter face the costs of maintaining multiple tooling lines to remain competitive for new orders. In the United Kingdom, the UK Rail Association estimated that the non-recurring costs of replacing just 16-20 wagon train types cost approximately $130 million AUD per year (2011 prices).

Such inconsistencies in early choices about design, standards and componentry also drive low-volume production batches, which in turn affect the viability of domestic production lines and make it difficult for domestic firms to retain their workforces in years of low or no production. Low-volume orders with high amounts of unique componentry lead to high build costs, which further challenge local firms. Again the Deloitte-ARA report benchmarked the losses caused by small batch runs, which can in turn be attributed to a lack of sufficient coordination in procurement across State boundaries. As an example, increasing an order size from 50 to 150 wagons reduces the unit cost of the wagon build by 40%, from $4 million each to just $2.4 million:

TABLE 3. **Impact of order size on the average cost per car (single–deck train example)**



Source: *Deloitte/ARA (2013)*

To place this example in context, a 150-car order is not an unreasonable scale for Australia. Industry feedback at interview, supported by the Deloitte-ARA findings, was that annual wagon demand nationwide was in the order of 300 units per year.

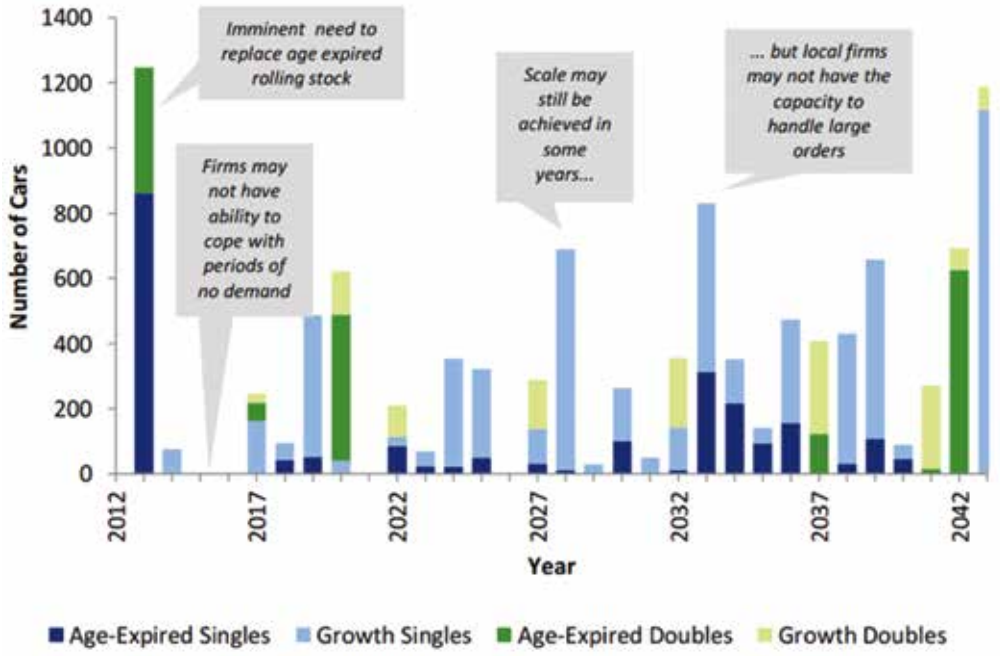
This approach also impacts adversely on the major cost drivers of rolling stock and their ongoing maintenance liabilities. Fragmented approaches to such costly and significant equipment and design specifics as train control systems, braking choices, specified construction materials, motive power choices, vehicle dimensions as they relate to train platforms and tunnels (loading gauge) – even, given long enough reinvestment timeframes, to track gauge choices - are of vital importance: nationally-consistent approaches can reduce costs over time, supporting a stronger domestic industry and reducing the cost of providing public transport to commuters.

Interviews with some Australian producers raised the point that participating in each State tender for wagon building was a considerable cost. One manufacturer ventured at interview that a typical tender effort could cost between $3 to 9 million. At times, there are clashes in tender timing between States, meaning in the short-run, some local manufacturers might be forced to forego bidding on some tenders, while in the long-run, local manufacturers are forced to spend more money on marketing in order to respond to all available work. The additional costs place further pressure on manufacturers' capacity to retain standing workforces during slow periods.

2. Turbulent, unpredictable demand for orders

Interviews conducted confirmed the observed case in published research that the public transport wagon manufacturing sector has operated on a 'boom and bust' business cycle, with very high volume years sometimes followed with years where no orders are sought at all. The Deloitte-ARA report outlines how this *status quo* approach is likely to impact the manufacturing sector over the next three decades, based on the 2013 assessment of future orders of both single and double-deck wagons of both the legacy and new generation types: the table below shows that under the current fragmented model, local manufacturers will continue to experience boom and bust, until very large order volumes start to arrive, at which point the local manufacturing industry may well already be lost to a full import model:

TABLE 4. **Rolling stock orders under the business as usual case**



Source: *Deloitte/ARA (2013)*

By contrast, Deloitte-ARA modelling of an optimal scenario found that this same forward demand could be smoothed to produce a roughly steady procurement requirement of around 300 cars per year, which would be a productive outcome for local manufacturing and significant by world standards. A 300-car order pipeline should be seen in context: in 2011, UK rail manufacturers advised their government that they could obtain significant cost efficiencies if stable orders of even around 150 cars of single design could be achieved[xii].

A more stable, efficient and predictable manufacturing pipeline allows local manufacturers the lead times to tool and staff to major orders. Under current arrangements, the often haphazard and short-notice nature of State procurement and planning often means that major orders go to offshore producers who can often better respond to ad hoc orders. The Deloitte-ARA report made the point that:

'There is increasing pressure on domestic rolling stock manufacturing and there exists a risk that all production could be sourced internationally'.

In this sense, making a serious reform effort in this sector is not simply about harvesting vast new opportunities. It is also about preventing the loss of an increasingly challenged domestic manufacturing sector.

3. Lack of benchmarks, common standards, decision-making data and tools

In 2011 the McNulty review of UK rail[xiii] considered that one of the main barriers to greater efficiency was:

'the poor quality of data available to support whole life cost decisions, or the fact that the data available in various parts of industry appear not to be available to decision-makers prior to key planning decisions'.

When compared to the UK industry - which was opened to above-rail commercial operators in the mid-1990s and has a single national track owner with a common track gauge - the information challenge facing the far more fragmented Australian public transport rail states is even greater. This was certainly the view of Mr Tony Taig, an eminent international rail figure who reviewed the Australian Rail Industry Safety and Standards Board for Australia's transport ministers[xiv]. Taig found that the Australian rail safety and standards arrangement:

'lacks focus on the economic and safety outcomes sought from standards and harmonisation' and that:

'No-one in Government has a clear focus on measuring and maximising nationally the benefits of harmonization'.

At the same time, Taig expressed surprise at the almost complete lack of common approaches across Australian State rail systems:

'*A major driver for the establishment of European Technical Standards for Interoperability has been to increase the scale of the markets available into which European manufacturers can supply. In many ways Australia almost seems to 'out-Europe Europe' in terms of how different the railways are from those in adjoining territories. While there may be short-term pain in adapting to more harmonised standards, the long-term benefit for the supply industry would be considerable'.*

Taig found that *'the benefits of harmonisation should be considerable, with safety risks mitigated and potential for $100s to $1000s of millions savings annually on railways across Australia'.*

Standardised efficiencies and centres of excellence elsewhere

Other benefits come from a funded commitment to centralised excellence in researching standard systems, designs and equipment which can inform procurement choices in different places. The European Union's MODTRAIN project sought to develop collaborative open standards for all aspects of train design, with a focus on modular design and reduction in parts employed in the build process. The project reported a 15% reduction in manufacturing costs[xv]. A central and authoritative body in such roles also allows for continuous measurement and feedback to drive nationwide improvements.

In the United States, the US Transit Cooperative Research Program within the Transportation Research Board – part of the US National Academies of Sciences, Engineering and Medicine in Washington DC – acts as a genuine centre of excellence in research, benchmarking, systems design and demand forecasting techniques, among other things. This exerts a harmonising and optimising effect on the many different public transport systems across US major cities and it acts as a source of much-needed skill development in the complex field of public transit economics and planning.

Australia lacks such arrangements: although it possesses the Rail Industry Safety and Standards Board, the Taig review of this body made it clear that this body lacks the necessary authority to act in this space and influence authoritative change across the States. That there have been no demonstrable changes in this respect since the Taig report was presented to transport ministers in 2013 suggests a *'status quo'* culture which may have little appetite for optimised national reform.

Benefits of reforming a fragmented economic sector

What level of productivity gains are plausible to expect in the context of a fragmented Australian public transport rail manufacturing sector? Modelling considered available comparable studies of productivity gains to the sector. Some of the gains were restricted to particular aspects of sector productivity, others were more comprehensive, as the following table illustrates:

TABLE 5. **Passenger rail procurement & manufacturing: comparative productivity gain estimates**

Study	Estimated annual available productivity gains	Comprising gains in	Comment
Deloitte Australia 2013 Greater Passenger Rolling Stock Procurement Efficiency	19%	• Optimising trains per order • Harmonised and smoothed production levels • Reduced heterogeneity • More market involvement in design standards • Smoothed funding for major procurements	Assumes a harmonised approach across the PT rail States without an observed case of any shared progress in this respect. The key gains stated in the Deloitte report were limited to a) scale; b) smoother demand; c) planning and design; and d) componentry harmonisation (cf. p. 6). Efficiencies from standardised, strategic national procurement practice do not appear to have been modelled, yet this was an area highlighted by industry at interviews for this submission as a major source of inefficiency.
ARUP UK (2011) Rolling Stock Whole Life Costs	Between 17-28%	Gains in strategy and planning – 20% Gains in specification and procurement (in build years) – 5% Gains from options evaluation before procurement decision – 18%	Assumes some data, tools and skills investments to realise benefits
TTAC (2012) Review of Australian Rail Industry Safety and Standards Board	Up to a nominal 30%		While ostensibly a safety standards review, the Taig Report provided expert opinion (after extensive observation) that greater standardisation/ harmonisation would create annual economic savings between the hundreds of millions to billions of dollars. Taig found the Australian sector to be highly fragmented and advised in terms of economic benefits available that *'I have no doubt that lack of harmonisation adds somewhere between a few % and a few tens of % to the cost of railway goods and services in Australia and potentially substantially more where interoperability is an issue'.*
UK train manufacturers via UK Rail Industry Association (2011)	8% of cost saving	Associated with bespoke (non-recurrent) design and development costs.	
EU MODTRAIN project	15% cost saving	Common manufacturing standards and designs	
UK train manufacturers via UK Rail Industry Association (2011)	20% cost saving	Based on examination of all orders between 1988-2010, compared to counterfactual scenario where continuity was available for orders	
Juturna-Cadence assessment for AMWU: average order of realisable gains	25% cost saving, rising to a high case of 30%		Based on examination of upside opportunities on offer through effective architectural reforms to a standardised national arrangement and informed by international comparators and industry feedback

Source: *Australasian Rail Association as at May 2016*

Estimating the scale of credible productivity gains for modelling purposes

A figure slightly higher than the Deloitte 19% was employed for modelling realistic standardisation productivity gains in the Australian passenger rail market through a dynamic economic model. A high case of 30% was modelled for sensitivity purposes. A 25% figure is recommended as a base case.

Chosen gains for modelling purposes – in context

The Deloitte report arrived at a 19% gain but this report did not appear to place substantial emphasis on what some in the industry warrant are significantly high-cost and uncertain tendering processes under the current State-based system. The Deloitte assessment of 19% also presumes that in the short-term, States will remain in control of their own PT arrangements and merely work to 'harmonise' efforts over time, by each developing their own harmonised State public transport rolling stock strategies[xvi]. While this is perhaps technically reasonable, there is little observational basis for this to be considered effective: for example, rail coach building 'harmonisation' was agreed as a priority area for reform in the 2009 Council of the Australian Federation meeting, but since this time no updates have appeared on progress and Taig made the point in 2012 - three years after this national agreement - that there was almost no data available on the amount of spending on PT by State, let alone agreed standards and benchmarks. The lack of serious ministerial action in response to Taig's report was perhaps itself telling.

In light of these facts, the harmonisation approach can be considered to have failed to deliver to date and, in particular given the views of Taig's review of the sector in 2013, could not be considered a reliable path to Australian reform of PT rail manufacturing: under status quo arrangements there appear to be structural barriers to the achievement of even the 19% Australian market gains proposed in the Deloitte report. Yet if the important structural deficiencies are tackled 'head-on' the gains appear large.

The baseline 25% also appears reasonable to this report in the light of an important UK comparator: analysis by ARUP in 2011 advised gains of 17 to 28% were on offer to the UK's rail manufacturing sector. It should be appreciated that such gains would come from a market far less fragmented than the Australian State PT jurisdictions, with certain efficiencies already inherent in the UK, which are not yet available in Australia:

- UK above-rail services have access to coach-leasing firms to smooth the fiscal challenges to acquiring new rolling stock at the right time
- There is a single national below-rail owner (Network Rail) in place for almost all UK track, operating on a common track gauge
- Although there are many different wagon types still in existence on the UK network, this number is being reduced actively and the UK has an agreed program in place for increased homogeneity (for example, the Network Rail rolling stock strategy recommends a move to just 5 broad classes of train in future, with common motive power, etc).

In this sense, given the much lower base of efficiency that the atomised Australian structure begins from, a 25-30% productivity gain appeared fully plausible here. 25% gains were regarded as 'comfortably achievable' by at least one national manufacturing CEO at interview. One productive basis for modelling mature gains is to assume a move to fully standardise PT rail procurement, manufacturing and maintenance through a national model of single management and ownership, probably with multiple State and Commonwealth shareholders, as per national freight rail reform in Australia in the early 1990s; this would also align the sector with the national standards that govern civil aviation, or maritime safety. This would also better align with aspects of the UK and French national models.

A note on public transport and freight manufacturing ratio assumptions

One important factor for further examination is a definitive position on the percentage of the rail manufacturing sector involving public transport as opposed to freight vehicles. The ratio chosen in this respect will have a considerable influence on the overall modelling outcomes. Industry feedback was sought on what a reliable ratio to employ might be, given the current profile of the sector overall. A ratio of 65% public transport builds to 35% freight was employed as a plausible post-mining boom ratio. This would benefit from further formal analysis.

Modelling methodology, results

The estimates are based on the Cadence Economics General Equilibrium Model (CEGEM). The model has significant flexibility in its sectoral and regional specification, which is important in the context of this analysis. Appendix 1 (page 18) provides more detail on this model.

The scenarios considered

The scenarios undertaken in the analysis fall under three categories.

The first category is the baseline, or reference case scenario, that begins with a base year of 2014/15 and covers a forecast period to 2024/25. Under this scenario, economic growth and labour market assumptions are imposed on the model to determine aggregate economic growth. Significantly, there is an assumption that investment in passenger rail manufacturing is $44 billion over the forecast period, spread equally across years. Other forms of railway rolling stock manufacturing, freight and mining, grow in line with aggregate economic growth.

The second category of scenario is the assumed shutdown of all railway rolling stock manufacturing in Australia. Under this scenario, all production of Australian railway rolling stock is replaced by imported sources in 2015/16.

This scenario is designed to give a point estimate of the contribution of the railway rolling stock manufacturing industry to the Australian economy. Under this scenario, real wages are held fixed and capital is not allowed to adjust out of the sector. In this context, the scenario is closely aligned to input-output modelling, and can be considered an upper bound estimate of the economic impact of shutting down the sector. The results of this analysis are summarised at Table 1 (page 7).

The final category of scenarios relates to assumed improvements in the efficiency of the Australian passenger transport rolling stock manufacturing sector.

Two scenarios are considered, one assuming a 25% increase in the efficiency of using all inputs into production (primary factors and intermediate inputs), the other assuming a 30% increase in productivity. These scenarios are undertaken under standard CGE modelling assumptions where real wages are free to adjust to changes in labour demand and capital is able to reallocate across sectors.

Improving productivity

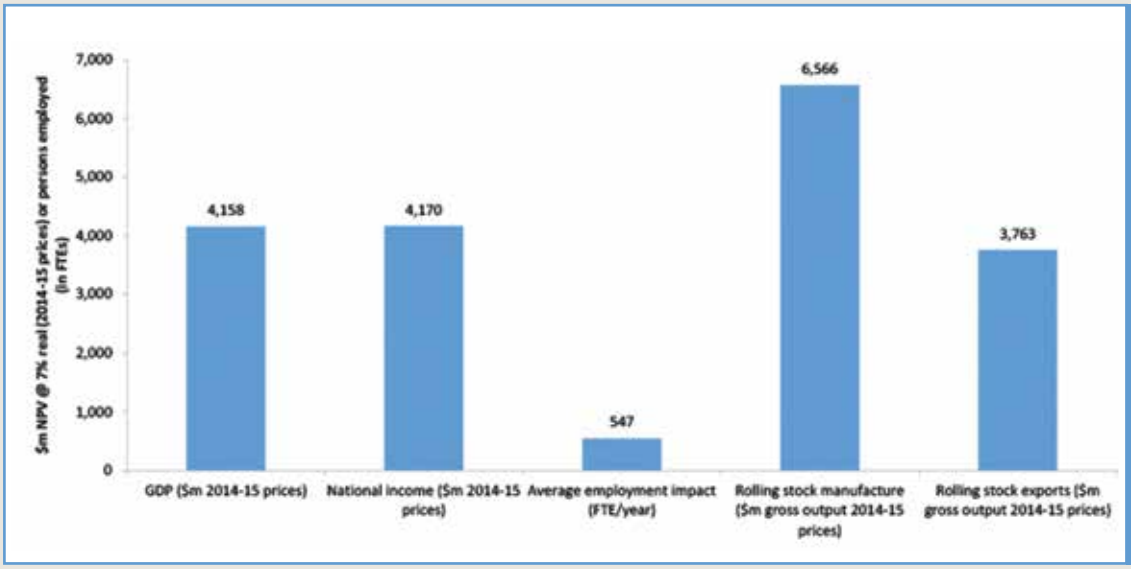
Improving the productivity of Australia's passenger rolling stock manufacturing sector would result in a significant gain in manufacturing jobs as well as an increased output and economic contribution.

This is because a 25% productivity improvement in the sector implies considerably less resources are required in the production process, reducing prices and freeing up resources to be used elsewhere in the economy. As a result, Australia's GDP is projected to increase by around $4.2 billion over a 10 year period (measured in real 2014-15 prices using a 7% real discount rate) and there is a commensurate increase in national income.

A 25% increase in productivity also results in higher levels of full-time employment across the Australian economy by an average of 547 persons over the 10-year period. Around half of this increase in employment is in the passenger transport rolling stock manufacturing sector. The other half of the increase in employment is in supplying sectors such as steel production.

This increase in GDP and aggregate production results in higher national income and employment over the same period. In the model results we can also observe that obtaining these efficiencies in the sector allows it to build a competitive international exports sector worth several hundreds of millions of dollars annually due to improved price competitiveness of Australian railway rolling stock on international markets.

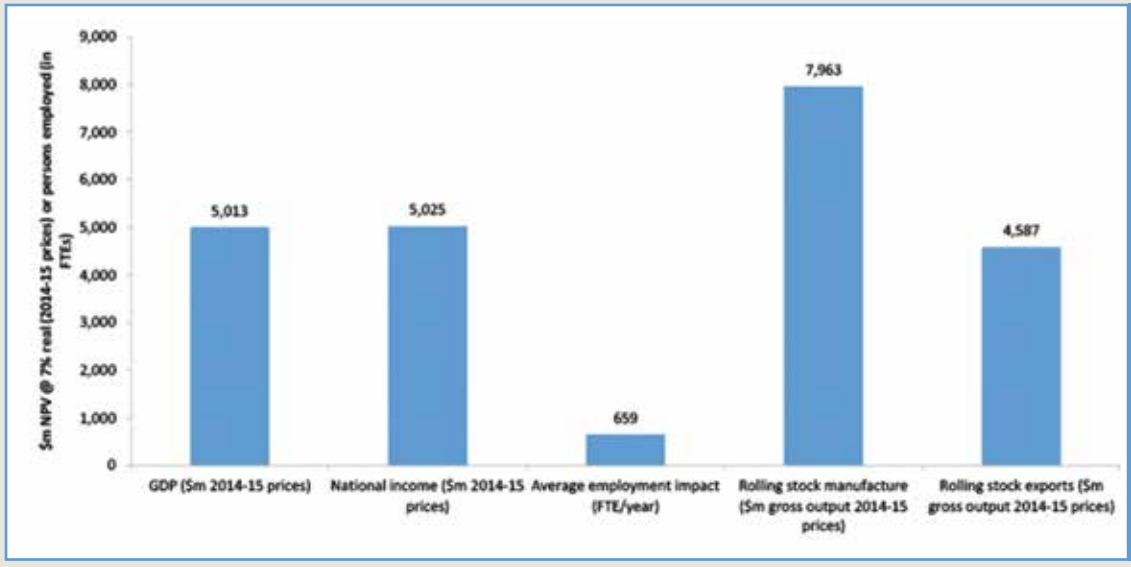
TABLE 6. **Impact over 10-years of a 25% productivity gain in PT rolling stock manufacturing sector**



NB *Rolling stock manufacture results may appear higher because they are expressed as gross output rather than valued added.*

The model results show that the benefits to the Australian economy are directly linked to the extent of the productivity improvements realised as a result of reform. Under a plausible upper-band 30% gain, the impacts on GDP, national income, employment and exports are significantly higher than under the 25% productivity scenario (see figure below).

TABLE 7. **Impact over 10-years of a 30% productivity gain in PT rolling stock manufacturing sector**



NB *Rolling stock manufacture results may appear higher because they are expressed as gross output rather than valued added.*

The emergence of a rolling stock export industry

The modelling also suggests the development of a substantial rolling stock export industry worth several hundred million dollars annually. This aspect of the modelling is encouraging, but warrants further analysis. The results for the passenger rolling stock industry are highly sensitive to parameters contained in the model. If the industry is assumed to have export potential, the standard parameter settings in the model imply large export responses given the assumed productivity gains. Further simulation and analysis is warranted around this aspect of the productivity gains.

Recommendations to secure the industry's jobs future

In 2011, leaders of the UK rail sector acknowledged similar rolling stock challenges:

'Extreme complexity…is no reason for inaction, inertia or quiescence… The need safely to drive inefficient cost out of the industry is paramount. Over the next two generations of rolling stock, potentially hundreds of millions of pounds could be saved'.[xvii]

Logic test: would the UK sector adopt the current 'Australian' model as a solution?

Consider the current UK industry and a counterfactual: would the UK – a public transport market around three times the size of Australia's – wish in the interests of efficiency to split itself into five or more substantially-autonomous sovereign public transport entities, which would largely pursue their own rolling stock plans, designs and procurement programs to their own timeframes, without recourse to a common set of standards and objectives, with no requirement to publish their results or measure their efforts against one another? The proposition is ludicrous. This underlines the urgency of doing better in the Australian context and not accepting vague undertakings as an acceptable reform solution.

Recommendation 1: **Gain a comprehensive sense of problem and opportunity**

Commission a market-led inquiry on the real benefits of reform

The Prime Minister and Premiers should agree to complement the analysis offered in this AMWU report with local manufacturers' views: a market–led examination of costs to the local rolling stock manufacturing industry incurred by maintaining multiple State–based planning, design and procurement arrangements should be commissioned. This should encourage all local manufacturers, suppliers, organised labour and rail operators to develop case studies quantifying the costs and risks of the current system. The process should model the benefits of moving to a national approach with a single source of national standards and accountability for all of these matters. Transport agencies should provide assistance to this examination as required. The process should be chaired by an international authority in this field. The process should report directly to the Prime Minister and Premiers with its findings and reform recommendations.

A national approach is required, with standardisation as its objective

How productive change might best be achieved is informed by the Australian Constitution itself, where the Commonwealth has a head of power in the standardisation of transport outcomes in rail. This submission underlines the overdue need for pursuing such outcomes.

A blueprint for practical improvements: Hawke-Keating National Rail Freight reforms

In considering how the gains on offer in public transport manufacturing reform might best be secured, the national reforms to the interstate rail freight industry by the Hawke and Keating Governments in the late 1980s and early 1990s should be considered.

The National Rail Corporation came about in 1991 because the Hawke Government's Interstate Commission had, amongst other things, made the improvement of national rail freight a priority for attention. In doing so, the leaders of the States, Territories and the Commonwealth were acknowledging that not all status quo State-based arrangements were working effectively for rail freight. National Rail Corporation legislation was facilitated by an agreement of State and Territory Governments *via* the Special Premiers' Conferences in 1991. It is worth noting that this decision was a matter for Premiers. It was not referred to transport ministers, as has been the case in the fragmented public transport sector to date.

It is also important to appreciate that this did not represent a Commonwealth 'takeover' of rail freight. Instead, assets were transferred to a corporation in which Commonwealth and States became equity shareholders[xviii]. Importantly, the corporation was also required to operate under 'best practice' labour arrangements, under a special award.

While national rail freight in Australia is still not perfect, it is beyond dispute that the Hawke-Keating national rail freight reforms repositioned this sector for a more productive future. Such an approach in public transport might be expected to meet some opposition. However, those in a position to influence such reforms should be cautious of arguments which assert that the national rail freight reforms are not appropriate as a reform template for public transport. It might be asserted that the rail freight reforms were all about 'break of gauge' and as such they are of no relevance for doing better in public transport. Such arguments would be ill-informed: the point of any national transport reform is to move to standardise the practices of members of the Federation and in so doing improve matters for all. This was the intent and structure of the Hawke-Keating national rail freight reforms. Public transport deserves a similar collegiate approach to reform, where all parties are equity partners in a reliably better outcome.

There certainly does not appear to be any practical case for removing the role of State public transport agencies overall, or for moving their responsibilities to the Commonwealth. Neither approach would be productive or practical, but a nationwide standard approach to procurement and manufacturing is desirable; it appears achievable by following aspects of the Hawke-Keating national reforms in freight.

Recommendation 2: **Implement a proven national reform structure**

Begin planning a national public transport authority

The Prime Minister and Premiers should examine the merits of establishing a national public transport authority where all States and Commonwealth are equity shareholders in a common structure that minimises the fragmentation of the sector and offers maximum opportunities for volume of orders, certainty and innovation for local manufacturers, suppliers and their employees. The national rail freight reforms are a useful template.

Wider benefits of national reform in PT rail manufacturing

1. Whole-industry, whole-life cost approach links rolling stock to fixed asset projects

One of the drivers of further public transport manufacturing reform in the United Kingdom and the European Union is that rolling stock and the infrastructure it runs on can begin to be planned, designed and delivered together, rather than as related but largely fragmented processes. Pairing a national view of rolling stock production with a clear and detailed national assessment of public transport infrastructure projects should result in more timely projects and better government priority setting in its infrastructure pipeline.

2. Strategic position from which to make decisions about local manufacturing content

The lack of a national, efficient industry prevents a truly strategic assessment of local content and how to achieve practical national outcomes. The existence of a national sector with national metrics allows governments to deal with the question of local content more strategically than through many fragmented parties. In the long run, taking a more national approach to rail manufacturing could allow the local content questions in this sector to be paired with local content decisions across other nationally-significant sectors such as mining, construction and especially Defence. Among other benefits, this could provide increased demand for strategically important but currently struggling Australian steel and other metals producers. Many of the core manufacturing skill sets are common across all of these sectors. Moving to a more national approach for public transport rail manufacturing would allow future governments to examine local manufacturing labour content in a far more strategic way, in the national interest.

Recommendation 3: **Use the reformed structure to drive better labour strategies**

Consider strategic manufacturing content in the national interest

A national structure must give active consideration to the long-term local manufacturing content requirements that might be in the national interest to retain in this sector.

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Disclaimer

This report has been prepared by Juturna-Cadence for the Australian Manufacturing Workers' Union. The information in the report has been prepared by Juturna-Cadence from open-source material and from client and industry consultation. All reasonable attempts have been made to ensure the accuracy of the information contained in the report, but the authors reserve absolute discretion in updating or amending this document.

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Appendix 1:

Overview of the CEGEM economic model

CEGEM is a multi-commodity, multi-region, dynamic model of the world economy. Like all economic models, CEGEM is a based on a range of assumptions, parameters and data that constitute an approximation to the working structure of an economy. Its construction has drawn on the key features of other economic models including models such as GTAP and GTEM, with state and regional modelling frameworks such as Monash-MMRF and TERM.

CEGEM is a recursive dynamic model that solves year-on-year over a specified timeframe. The model is then used to project the relationship between variables under different scenarios, or states, over a predefined period.

Labour, capital, land and a natural resource comprise the four factors of production. On a year-by-year basis, capital and labour are mobile between sectors, while land is mobile across agricultural sectors. A natural resource endowment is specific to mining and is not mobile. A representative household in each region owns all factors of production. This representative household receives all factor payments, tax revenue and interregional transfers. The household also determines the allocation of income between household consumption, government consumption and savings.

Capital in each region of the model accumulates by investment less depreciation in each period. Capital is mobile internationally in CEGEM where global investment equals global savings. Global savings are made available to invest across regions.

The model assumes labour markets operate to adjust employment and wages in each year so that, for example, in the case of an increase in the demand for labour, the real wage rate increases in proportion to the increase in employment from its base case forecast level.

CEGEM determines regional supplies and demands of commodities through optimising behaviour of agents in perfectly competitive markets using constant returns to scale technologies. Under these assumptions, prices are set to cover costs and firms earn zero pure profits, with all returns paid to primary factors.

The advantage of a global model such as CEGEM is that it accounts for bilateral trade flows of all commodities between regions. Goods are imperfect substitutes, implemented through the Armington assumption. The model does not require the regional current account to be in balance as the capital account can adjust to maintain balance of payments equilibrium.

Base data

The starting point for the base data in CEGEM is the global database produced by the Global Trade Analysis Project (GTAP). This database is comprised of 140 country and regional groups and 57 production sectors. The Australian component of this database was supplied by the Productivity Commission, and is based on Australian input-output tables produced by the Australian Bureau of Statistics (ABS).

For the purpose of this exercise, the database has been aggregated to the 13 sectors shown in Table 8. Of significance, Railway rolling stock manufacturing has been separated from manufacturing in the database. This sector includes passenger transport manufacturing, along with freight and mining. The database also has State-level detail along with a Rest of the World region.

TABLE 8. Sectors and regions in CEGEM

Number	Sector	Number	Region
1	Agriculture	1	New South Wales
2	Coal	2	Victoria
3	Oil	3	Queensland
4	Gas	4	South Australia
5	Other Mining	5	Western Australia
6	Railway rolling stock manufacturing	6	Tasmania
7	Manufacturing	7	Northern Territory
8	Electricity	8	Rest of the World
9	Water		
10	Construction		
11	Trade		
12	Transport		
13	Other Services		

i See Commonwealth Parliamentary Library Commonwealth involvement in reform of the rail freight industry Research Paper No 19 (2008–09)
ii The full 1992 One Nation policy statement can be found online at: http://www.voced.edu.au/content/ngv%3A675 site accessed 20 May 2016
iii See Commonwealth Parliamentary Research Service Rail and Urban Public Transport: Commonwealth Funding and Policy Issues Research Paper No 12 (1994)
iv Deloitte for Australasian Rail Association Opportunities for Greater Passenger Rolling Stock Procurement Efficiency (2013)
v Jane-Frances Kelly and Paul Donegan Mapping Australia's Economy: cities as engines of prosperity Grattan Institute (2014)
vi Emeritus Professor Remy Prud'homme Urban Transport and Economic Development a paper for the 7th conference on the development and planning of urban transport in developing countries, New Delhi (1996)
vii UK Rail Association figures quoted in Network Rail UK Rail Utilisation Strategy: Passenger Rolling Stock (2011)
viii ARUP UK Rolling Stock Whole Life Costs a research paper in support of the McNulty Rail Value for Money Study (2011)
ix Deloitte for Australasian Rail Association Opportunities for Greater Passenger Rolling Stock Procurement Efficiency (2013) p.16
x Productivity Commission Inquiry into Public Infrastructure Vol 1 No 71 (2014)
xi Taig, Tony, Review of the Rail Industry Safety and Standards Board and its MoU with the Governments a report for Australia's Standing Council on Transport and Infrastructure (2013)
xii Network Rail UK Rail Utilisation Strategy: Passenger Rolling Stock (2011) p. 54
xiii UK Department for Transport and Office of Rail Regulation Realising the Potential of GB Rail Final Independent Report of the (McNulty) Rail Value for Money Study (2011)
xiv Taig, Tony, Review of the Rail Industry Safety and Standards Board and its MoU with the Governments a report for Australia's Standing Council on Transport and Infrastructure (2013)
xv European Union On Track to a Sustainable Future: EU-funded research for a safe and efficient European Rail system (2010) p.16
xvi Deloitte for Australasian Rail Association Opportunities for Greater Passenger Rolling Stock Procurement Efficiency (2013) p.7
xvii Network Rail UK Rail Utilisation Strategy: Passenger Rolling Stock (2011) p. 3
xviii See Commonwealth Parliamentary Research Service Rail and Urban Public Transport: Commonwealth Funding and Policy Issues Research Paper No 12 (1994)


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