AUSTRALASIAN RAILWAY ASSOCIATION

ARA Submission

Inquiry into the Australian Manufacturing Industry

Senate Economics Reference Committee

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ABN 64 217 302 489

The ARA

The Australasian Railway Association (ARA) is the peak body for the rail sector in Australia and New Zealand, and advocates for more than 170 member organisations across the industry.

Our membership covers every aspect of the rail industry, including:

- The passenger and freight operators that keep essential rail services moving;
- The track owners, managers and contractors that deliver a safe and efficient rail infrastructure network; and
- The suppliers, manufacturers and consultants that drive innovation, productivity and efficiency in the rail industry.

The ARA thanks the Senate Economics References Committee for the opportunity to provide a submission to the *Inquiry into the Australian Manufacturing Industry*.

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Introduction

The rail industry in Australia is currently experiencing an unpresented level of infrastructure investment, with over $155 billion forecast to be invested in rail over the next 15 years. This huge pipeline of investment provides a great platform and opportunity to strengthen Australia's rail manufacturing sector to service local demand, as well as to identify opportunities to export globally.

Unfortunately, the rail manufacturing supply chain in Australia has suffered from significant legacy issues including a highly fragmented market, which is compounded by varying jurisdictional policies on procurement, standards, type approval, and local content requirements. While these issues are complex and difficult to overcome, they are not insurmountable, and the ARA believe the Federal Government has a key role to play in supporting the revival of Australia's rail manufacturing sector.

The rail network in Australia is much more than stand-alone infrastructure, it supports an entire industry made up of over 900 businesses that support more than 165,000 jobs, which contribute $30 billion to the Australian economy[1]. The rail rolling stock manufacturing and repair sector makes up a relatively small proportion of this contribution with annual revenues of $2.4 billion and direct value-add to the economy of $515 million. This economic contribution could be increased significantly in the coming years; however this can only be enabled by significant government commitment to policy reform that better supports local rail manufacturing.

[1] ARA Value of Rail, Deloitte Access Economics, 2020

The ARA would also like to draw the Committee's attention to an ongoing *Inquiry into procurement practices for government-funded infrastructure* being undertaken by the House of Representatives Standing Committee on Infrastructure, Transport and Cities.

Given the nature of the rail industry in Australia, there are very close links between reforms to government procurement processes and the ability to strengthen our local rail manufacturing supply chain. The passenger rail networks across Australia are largely owned and operated by state government entities, while the major interstate rail freight network, including Inland Rail, is managed by the Federal Government through the Australian Rail Track Corporation (ARTC). With such a high level of government control of Australia's rail network, the policies and decisions made for rail infrastructure procurement have a direct impact of the health of the local rail supply chain.

The ARA has also provided a submission to the *Inquiry into procurement practices for government-funded infrastructure*, and would recommend the Committee consider the deliberations in that Inquiry. For sectors like rail, where government procurement policies play a significant role in viability of local supply chains, the findings of that Inquiry will be of direct relevance.

The following submission provides several recommendations that the ARA believes would be very beneficial to improving the rail manufacturing in Australia, in turn fostering a much stronger and more resilient local supply chain.

Addressing the Terms of Reference

The following section addresses each of the Terms of Reference for the Inquiry, including recommendations for the Committee to consider.

a. what manufacturing capacities Australia requires for economic growth, national resilience, rising living standards for all Australians and security in our region;

While the health of the local rail supply chain has improved in recent years with the significant pipeline of rail investment, challenges and threats to its longer-term sustainability remain.

The domestic rail industry has numerous legacy issues that impact its ability to scale up and operate at optimal efficiency. While some of these problems are due to the unique development of the rail industry in Australia, others are the result of persistent mismanagement, misallocation of resources and poor national transport policy. Threats to the local supply chain include:

- Historically fragmented sub-national markets in terms of regulations, standards, systems, technologies and competencies that stymie scale economies, innovation and skills development
- Regulatory, funding and pricing models that disproportionately favour investment in road freight haulage at the expense of rail freight, considering rail's economic and social benefits
- Procurement processes that are inconsistent between jurisdictions, increasingly complex, increasingly allocate risk from procurers to the supply chain and do not effectively support innovation nor local participation and investment

- Local content policies that tend to amplify challenges wrought by fragmentation and work against developing a strong national supply chain, exacerbated by manufacturing facilities being duplicated in various jurisdictions

- Volatility of investment in fixed rail assets, as well as rollingstock, which also inhibits private sector investment in long term capacity

Critically, many of these issues are interlinked. While the fragmentation of the Australian rail industry is a historical legacy issue, subsequent regulatory, innovation and procurement policies have continued to hamper industry sustainability and growth. It is the culmination of these issues that has created a significant barrier to achieving requisite scale in the Australian market for many rail manufacturers.

Only with sufficient scale can local industry invest in skills, undertake necessary investment in innovation, and build more reliable and internationally competitive advanced manufacturing systems and processes that can more readily compete in global markets.

This is important as international markets are a source of more stable, supplementary demand that can support growth and sustainability in Australia's rail supply chain. Unfortunately, the pathways for local Australian suppliers into global supply chains is not clear or available for most.

Foreign companies tend to rely on their own local subcontractors and supply chains where they are most familiar with quality and other risks and challenges. Unless Australian firms team up with major international suppliers, being more integrated with global supply chains is extremely difficult in practice.

The COVID-19 pandemic and the steps governments have taken to bring it under control, have unfortunately had a significant impact on some parts of the economy. For rail manufacturing, this has had the greatest impact on workforce limitations. The Australian rail supply chain relies heavily on strong, coordinated global production and trade links, noting the increasing internationalisation of complex rail equipment, systems and components. Even with this significant international reliance, the Australian rail supply chain has remained somewhat resilient, albeit with increasing challenges and costs. However, border closers, both internationally and domestically have certainly impacted access to skills. With many large manufacturers being national or multinational companies, rail supply chains are highly interlinked across borders, and as a result this has constrained access to skills in manufacturing and has particularly hampered onsite commissioning and testing of rail assets.

Overall, restrictions on the movement of people have highlighted the need for a more resilient local skills pool. This could be supported by more stable domestic demand and would assist in balancing volatilities in export opportunities.

Australia should be selective of where it should invest in manufacturing capacity. Australia will be uncompetitive internationally if it attempts to compete on cost in low-value, low-design, and low-tech manufacturing, due to its high input costs. However, there are significant manufacturing investment opportunities in high value add sectors.

There are many examples of Australian manufacturing capabilities that have shown they can compete internationally. Pandrol, a manufacturer in Western Sydney is having success in exporting components to the Asian region, being competitive on cost, due to its manufacturing processes but also through its superior product design.

Another example is Knorr-Bremse Australia, which is considered a regional Centre of Competence for HVAC (heating, ventilation, air-conditioning). The organisation has 35 engineers and a research and development centre with world class climate chambers located at Granville, NSW. Knorr-Bremse Australia is currently locally producing HVAC units for Melbourne (HCMT) and Perth (Metronet) in Melbourne and Perth, units for export to Dhaka at Granville, units for defence applications for domestic defence contractors, as well as units for mining and exporting to the US and Thailand. In addition, they are currently engineering, project managing and invoicing from Australia rail projects in Vancouver, Chicago, Hong Kong, Doha, Philadelphia and Baltimore using intercompany contract manufacturers.

This example demonstrates that if an organisation can establish competent local specialist engineering capability, combined with reasonable local volumes (ideally aggregated in one location) then it opens up the ability to export and play successfully on a global stage.

However, if local manufacturing capability is lost in key skill areas, it not only increases the risk around project delivery should the international supply chain experience volatility, but the maintenance capability is also impacted in the local market. Manufacturing is also a major source of commercial innovation to enable growth. It is essential that we have government policies that foster the growth of local manufacturing capabilities, rather than hinder it.

b. the role that the Australian manufacturing industry has played, is playing and will play in the future;

The ARA's Value of Rail Report 2020 stated that the rail rolling stock manufacturing and repair industry has revenue of just over $2.4 billion and a direct value-added of $515 million. In 2019, the rail rolling stock manufacturing and repair industry supported around 4,087 FTE workers, similar to the amount in 2016. For every million dollars spent by the rolling stock manufacturing and repair industry, around 1.32 (direct and indirect) FTE roles are generated.

The rail rolling stock manufacturing and repair industry spends five times more on intermediate inputs than wages, whereas the average across the entire economy is closer to two times. For example, it spends more than $300 million on intermediate inputs from the structural metal product manufacturing industry and professional, scientific and technical services industry. The rail rolling stock manufacturing and repair industry's expenditure on intermediate inputs also boosts employment, especially for labour-intensive industries such as the iron and steel manufacturing industry. This shows that rail rolling stock manufacturing can play a significant role in boosting activity all along the supply chain.

Rolling stock manufacturing accounts for 11% of rail employment in Australia.[2] As shown in Figure 1 on the following page, employment is largely concentrated in the Sydney and Melbourne

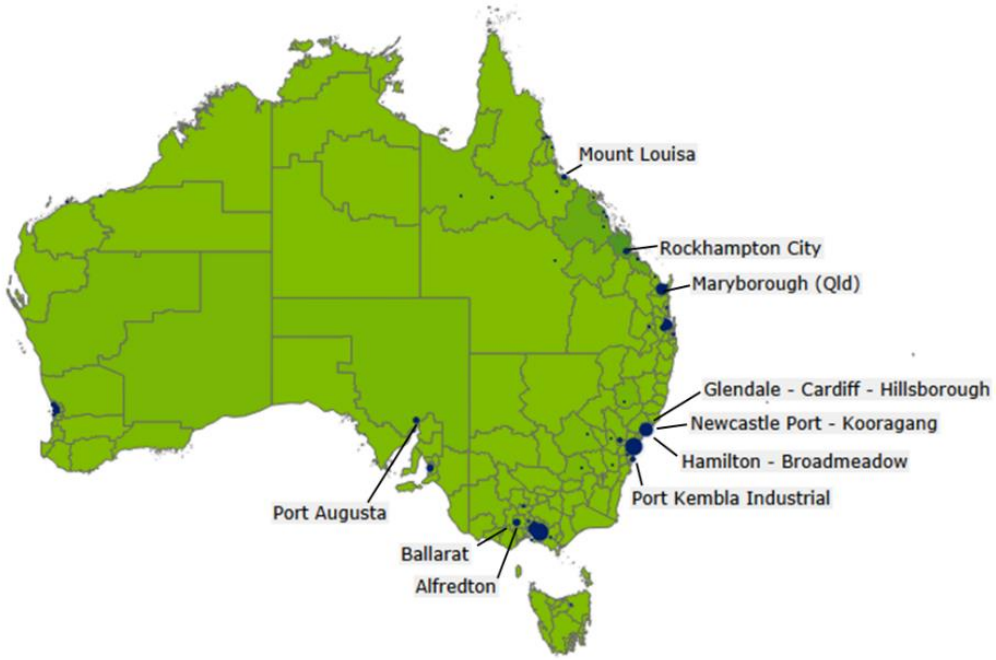
[2] ABS Census (2016) *Place Of Work (POW) ANZSIC Industry Data*

metropolitan areas, which together account for 50% of the national total but tends to be in outer-metropolitan areas. The main non-capital city employment bases can be found in Newcastle, Maryborough and Lake Macquarie.[3]

The following regional centres are the major employment hubs for rolling stock manufacturing and repair across Australia, based on ABS Census data from 2016 and data from ARA members. It should be noted that there are also many other rail manufacturing facilities across Australia dedicated to producing rail infrastructure components such as rail, signalling equipment, sleepers, fastenings, points and crossings to name just a few.

- Rollingstock manufacturing and repair hubs
  - Dandenong
  - Newcastle
  - Maryborough
  - Lake Macquarie
  - Ballarat
  - Rockhampton
  - Newcastle
  - Port Augusta
  - Port Kembla
  - Bellevue (Perth)
  - Townsville

Figure 1: Top ten regional rolling stock manufacturing and repair employment clusters in Australia



[3] Ibid

The ARA's Rail Supply Chain Report 2021, confirms that the Australian rail supply chain comprises of many hundreds of businesses. These businesses provide goods or services directly to the rail industry – including manufacturers, equipment suppliers, professional services and contractors – public and private sector organisations that operate or procure rail assets as well as education facilities and registered training organisations (RTOs) that train the rail industry workforce. Many of these organisations also provide goods and services to other sectors of the Australian economy, and so do not necessarily identify themselves, first and foremost, as part of the rail industry. Collectively, however, together with specialist rail businesses, they form a critical supply network of skills, materials, technologies, equipment and value adding services. 1,200 firms which had at least some connection to the rail industry.

The rail supply chain is spread throughout Australia's eight states and territories. Overall, much of the rail supply chain is largely concentrated in New South Wales and Victoria – reflecting that these most populous states will tend to be centres for passenger and freight rail operations. However, there is also a substantial presence of firms in Queensland and Western Australia where heavy haul rail operations for commodities such as iron ore and coal are also significant. The Hunter Valley Coal Chain (HVCC) in New South Wales is also an important driver of supply chain location and operation for heavy haul-related activities in that state.

Many firms operate across borders. In achieving a more sustainable, and competitive rail supply chain, any artificial cross-border barriers that may be preventing effective transfer of capacity or skills between Australian jurisdictions should be reviewed. Implicitly, restricting market access prevents the access to opportunities to achieve costs of scale and a sustainable rail supply chain.

Maintenance represents a substantial proportion of supply chain activity, followed by manufacturing and construction. The high proportion of firms reporting a maintenance focus is consistent with other studies of the rail industry in recent years and highlights the importance of sustaining maintenance-related local industry and skills in the workforce. While the large forward pipeline of rail investment is of direct interest to the Australian rail supply chain, it will also deliver a large value of capital stock that will need to be maintained locally.

There are also a number of critical factors that determine the health of the local supply chain, including the procurement processes, partners and technologies chosen, and the connections with local suppliers. These factors all have potential long-term impacts on the ongoing maintenance associated with projects, as well as the specific skillsets required. Given the upcoming pipeline of work expected over the next five years, and the connections these firms already have with local operations and maintenance suppliers, it is important that rail procurers (particularly in government) are aware of the capabilities and skills of these firms and recognise the longer-term economic benefits that can accrue from utilising locally based manufacturing and construction businesses.

c. the drivers of growth in manufacturing in Australia and around the world;

Australia has a viable and active rail manufacturing capability, with a potential to grow.

ARA's Australian Rail Supply Chain Report published in March 2021 indicated that work on major projects valued over $2 billion is forecast to more than double within the next five years – from around $4 billion in FY2020 to around $10 billion by FY2023 as a range of new passenger and freight assets are delivered. Within the next five years, simultaneous work on many separate major rail projects is expected to drive annual rail construction activity over $14 billion - more than double the level of activity at the peak of the mining boom and remain sustained at historically high levels in the subsequent decade.

Meanwhile, strong global demand for Australian iron ore and coal for global steel production is driving further substantial private and public investment in heavy haul rail networks in Western Australia, Queensland and New South Wales. As the global economy eventually recovers from the "COVID recession", public stimulus measures around the world are likely to drive further increases in demand for raw commodities, providing a further boost to demand for Australia's high quality mineral resources, which will in turn necessitate further investment in heavy haul transport networks.

With that being said, government must also be conscious of climate change commitments when considering investment in assets such as rolling stock, which typically have a service life well in excess of 30 years. Accordingly, any new motive power for rail (locomotives and multiple-unit passenger trains) purchased from now on would be expected to remain in service until at least 2050. The necessary transition away from diesel fuel in order to achieve net-zero emissions by 2050 must be factored into rolling stock procurements starting now. Clean motive power technology for rail therefore represents a significant and immediate opportunity to establish new capabilities and businesses in Australia's manufacturing sector to support the rail industry's energy transition.

As well as catering for new demand, the rail industry is also facing a significant wave of investment to replace aging equipment and systems, with many of the current control systems and equipment reaching the end of their useable life. This large phase of investment will place greater demands on Australia's rail supply chains across manufacturing, construction, transport and logistics, as well as operations and maintenance activities as the new assets come online.

However, this also presents a 'once in a generation' opportunity for the Australian supply chain to invest in their own capacity and capability, and in doing so, grow local businesses and employment. With the right policy settings, the Australian rail supply chain could achieve greater economies of scale, greater participation and innovation, raise overall industry productivity, as well as improve international competitiveness and export potential.

The COVID-19 pandemic has also emerged as a key threat and opportunity for the Australian rail supply chain. Australian rail businesses, as with their counterparts overseas, have been negatively impacted by measures designed to restrict the spread of COVID-19, particularly in the free movement of skills. But the pandemic is also leading to a re-evaluation of the strength and depth of global supply chains, the need for diversified sources of supply, and accelerating the adoption of new productivity-enhancing technologies.

Australia's relatively strong performance in suppressing COVID-19, greater competitiveness from a lower Australian dollar, and the increasing need for stronger, more diversified global supply chains

represents an unprecedented opportunity for the Australian rail supply chain to grow and prosper in both local and international markets.

On balance, the record forward pipeline of rail investment and new behaviours wrought from COVID-19 offer an unparalleled opportunity for the local rail supply chain to break free from well-known and previously reported constraints that have held it back from achieving sustained, healthy growth in the past. Some of these constraints include boom/bust investment cycles, fragmented markets, risk-averse procurement, and a lack of harmonisation, all of which result in low economies of scale with limited opportunity for innovation and investment.

Maximising the use of the local supply chain is the key to optimising the broader economic impact of the strong pipeline of rail investment and ultimately creating thousands of new, highly skilled, Australian jobs. The future health and long run sustainability of the Australian rail supply chain is at a critical juncture. Severe threats and challenges remain but meeting these challenges now has the potential to yield tremendous employment, as well as broader social and economic benefits, in coming years.

Consequently, industry and governments urgently need a better understanding of the current capabilities and capacity of the Australian rail supply chain, the challenges they face that stymie growth and jobs creation, where opportunities for reform exist and recommendations which will maximise benefits for Australia.

Experiences during COVID-19 have prompted a public discussion about the reliability of global supply chains and to what extent Australia needs local manufacturing capabilities to deliver critical transport infrastructure and services.

Expanding opportunities for local suppliers to compete does not need to involve direct subsidies or blunt procurement regulations favouring Australian suppliers. Instead, a broad-based view across procurement, skills and commercial arrangements could help ensure Australia's manufacturing sector has the appropriate opportunity to participate over the longer term. Australian governments could coordinate ordering to create more reliable pipelines of work for local manufacturers.

Governments could work with industry to identify any barriers to competitiveness in the local industry, such as skills/labour market issues or regulation. Governments can look for opportunities for local players to participate in procurements through components, maintenance and repairs.

On Track to 2040, whilst published close to 10 years ago outlines trends and drivers, and assesses Australia's rail manufacturing opportunities against its assessed capabilities, which still holds true. It identified opportunities align with Australian local capabilities in:

1. Materials and manufacturing;
2. Monitoring and management;
3. Power and Propulsion

BIS Oxford Economics indicated in the Australian Rail Supply Chain report that strengthening opportunities for domestic manufacturers could enhance competitive tension, and create more economic stimulus in regional areas; as most rail manufacturing is done regionally. In addition, the

increasing use of automated and connected technologies combined with the critical role that rail transport plays in our economy suggests that Australia may need to enhance its domestic capabilities in areas such as cyber-security and telecommunications in rail in particular.

Other key drivers in rail include energy storage, safety, productivity, asset management, digital technologies, customer experience and traffic control systems.

d. the strengths of Australia's existing manufacturing industry and opportunities for its development and expansion;

Rail manufacturing in Australia has many strengths and opportunities for further development and expansion, many of which are raised throughout this submission. However, there should be a particular focus on:

- sustainability (including development of jobs and skills);
- a national approach to rail manufacturing;
- high efficiency, automation driven manufacturing to remain competitive with low-cost labour nations; and
- resilient planning and cooperation with other suppliers in the face of uncertain volatile markets.

e. the sectors in which Australian manufacturers enjoy a natural advantage in energy, access to primary resources and skilled workers over international competitors, and how to capitalise on those advantages;

In addition to the key areas of Power & Propulsion; Materials and Manufacturing; and Design, Modelling and simulation, identified in the On Track to 2040 report, the Rail Manufacturing Cooperative Research Centre recommended in its *Collaborative Rail R&D Successes, Challenges and Future Opportunities, a Rail Manufacturing CRC Perspective* report published in 2020, that Australia's rail industry should focus on the following key areas of ongoing research, to deliver the needs of the rail industry into the future:

- energy storage systems for light rail, hybrid rail and auxiliary power applications;
- high temperature batteries for outback rail applications;
- rollingstock-based sensors and applications for real-time condition-based monitoring above and below rail;
- coatings and laser repair treatments of rail components, including cold spray coatings for anti-corrosion and surface repair, and laser repair of rail components;
- weld modelling for ensuring the quality and reproducibility of fabricated rail parts;
- condition-based modelling and predictive maintenance models for rollingstock and rail infrastructure;
- passenger congestion systems that alleviate crowding, reduce train dwell times and improve customer service;
- passenger information systems that provide passengers with information to create a better customer experience;

- automated use of drones and robots to monitor track, culverts and rollingstock reducing corridor access times and reducing risk to staff;
- advanced materials and material analysis for increased longevity, reduced volume to landfill at end of life;
- virtual and augmented reality applications for training;
- new lightweight materials for rollingstock;
- video analytics for fault detection; and
- the use of low-cost robotics in rail manufacturing and maintenance facilities.

f. identifying new areas in which the Australian manufacturing industry can establish itself as a global leader;

A recent internal survey of Australian suppliers indicated they are currently focusing their research efforts in the following areas, as they consider this to be the largest area of future opportunity in the rail sector and more broadly:

- Energy storage, energy efficiency, energy movement;
- Sustainability – hydrogen fuel systems, battery storage, clean energy technologies;
- Cyber security;
- Big data and Artificial Intelligence;
- Rollingstock productivity – maintenance periods, passenger management, reliability, lower costs, accessibility;
- Digital transformation;
- New passenger and freight mobility systems;
- Carbon footprint, low emissions manufacturing;
- Closed loop consumption;
- Project related social performance; and
- Passenger and freight end to end journey, accessibility and inclusion.

g. the role that government can play in assisting our domestic manufacturing industry, with specific regard to:

i. research and development;

The ARA's report *Finding the Fast Track for Innovation in the Australasian Rail Industry* highlights that Australia is well behind its international peers in the development and application of new technologies and innovations, and there are a number of barriers unnecessarily limiting the rail industry in becoming a world leader.

These barriers include:

- market fragmentation in rail-based systems, creating a fractured buyer market for new technology and requiring multiple pathways to market for the same product;
- multiple standards and type approvals based on the varying requirements of each operator;
- lack of continuity in government funding and investment in rail R&D, and a collaborative mechanism in bringing industry and innovators together, with a focus on commercialisation;

- a risk averse culture which does not foster or encourage experimentation and innovation; and
- public sector procurement mechanisms do not properly assess whole of life costs or incentivise innovation.

New rail technologies require significant funding and strong partnerships between innovators, manufacturers and operators to develop, commercialise, manufacture and deliver at scale. Having a local body to help lead and coordinate research and development (R&D) streamlines innovation, provides access to previous R&D activities and their outcomes, and, depending on the funding structure, helps share the large upfront cost amongst many different firms reducing individual burdens.

In this regard, the closure of the Rail Manufacturing Cooperative Research Centre (RMCRC) in June 2020 was a backwards step. Without a national approach to rail innovation, Australia risks missing substantial opportunities in a post-COVID environment, where advanced manufacturing is recalibrating global supply chains to ensure resilient and efficient local supply.

The sustainability of the Australian rail supply chain in the longer term requires firms to be continually innovative, to seek best-in-class solutions and be ready to adopt or develop new technologies. Australian rail suppliers tend to be 'technology takers' given the availability of scaled rail technologies and systems that have been finetuned and developed overseas. However, Australian firms can and have developed niche, nimble technologies, products and services that can support these overarching systems, in turn creating world-leading solutions that can themselves be adopted across global supply chains.

The development of pantograph manufacturing (the apparatus mounted on the roof of an electric train or tram to collect power through contact with an overhead line) in Australia is an example of how innovation and local manufacturing incentives can be aligned to produce world class rail products and a valuable export industry. However, this requires ensuring there are incentives to innovate, so that the industry, the tertiary sector and governments can develop collaborative R&D and innovation models. It is also important to ensure that Australian innovation is recognised and promoted globally.

Current rail procurement processes in Australia tend to favour risk averse solutions. This creates an incentive to focus on lowest risk solutions that utilise established technologies at the expense of cost or performance. This is turn drives a focus on lower risk solutions even if they are more expensive to deliver. This approach adversely effects the cost of local innovation and improvements to rail technologies, systems and processes – impacting long-term value for money and potentially limiting growth in advanced manufacturing and highly skilled jobs. Without support to undertake innovative (and naturally riskier) solutions, Australian firms are simply unable to dedicate optimal resources to innovation.

There is also an opportunity for procurement processes to support innovation that drives improved sustainability outcomes in the infrastructure sector. Infrastructure Australia's 2019 Australian

Infrastructure Audit, and the later release of its sustainability principles, highlighted the importance of adopting sustainability-enhancing approaches to infrastructure assets. Australia has an opportunity to establish itself as a leader in this field. However, the focus on risk averse solutions in current procurement processes can limit innovation to support this goal.

As jurisdictions increase their focus on emissions reduction and the long-term liveability of their cities and towns, consideration should be given to ensuring the procurement process supports the development of sustainable and resilient infrastructure that delivers long term value to the community. Additionally, the challenge of differing standards, requirements and type approvals between jurisdictions leads to technologies being implemented inconsistently across Australia. Streamlining regulatory testing processes for new technologies, so that type approval by one network operator provides 'trust markers' for others, would greatly enhance the prospects for inter-jurisdictional standardisation.

The ARA does note the Government's recent announcement of investing $20 million in research capacity at regional universities as a positive step forward. The Regional Research Collaboration (RRC) program will link universities and local businesses to solve local and global challenges in areas such as energy and hydrogen technology, which are applicable to rail.

Recommendation:

1. The ARA recommends the Commonwealth Government support the establishment of a national rail innovation and research body that: • drives national planning and coordination of investment; • fosters the development of national capability; • provides a collaborative model to support short term commercialisation investment; and • fosters long-term research and development in rail.
2. The ARA recommends the Commonwealth Government consider the development of an incentive scheme for the application of new technologies and innovations to Commonwealth funded infrastructure projects.
3. The ARA recommends the Commonwealth Government ensure its procurement processes support an innovation culture and appropriately value the application of new technologies, particularly regarding sustainability, which can be seen as cost prohibitive.
4. The ARA recommends that the Commonwealth Government facilitate the development of a mutual recognition process of type approved products and a national register of products, and methodologies.

ii. attracting investment;

A nationally coordinated investment rail project pipeline would provide clarity and enable forward planning for industry to appropriately invest. Having a frequently updated and transparent public pipeline of projects would also allow industry to invest, plan and train to prevent capability and capacity challenges.

The ARA's Australian Rail Supply Chain report published in 2020 highlighted the importance of this issue, recommending that investment pipelines be regularly reviewed and published well before procurement phases commence. This would ensure local firms have adequate time to prepare and invest to meet the forecast demand.

However, the issue is broader than just having a visible long-term pipeline of work. The promise of work is not enough. The supply chain cannot make commercial decisions to invest in specific capacity and capability until they are contracted to a project. Therefore, delays in the procurement process and the execution of contracts can be an impediment to timely delivery of project milestones. In the absence of a national coordinating body, state governments should regularly review and re-publish their rail investment pipelines, as well as committing to the priority project recommendations of Infrastructure Australia.

It is widely recognised that the unpredictability and often cyclical nature of government investment in rail, inhibits private sector investment in long term capacity. The smoothing of a pipeline that addresses boom bust cycles ensures stability of capacity requirements and maintains employment of specialised and competent workers.

Another key barrier to investment is the inconsistent application of local content policies (LCPs), which can disadvantage the parts of the local supply chain outside of the jurisdiction where the LCP is originated. The demand in each state is simply not sufficientto maintain a manufacturing capability in each state servicing that jurisdiction's demands. A national approach to local manufacturing would allow established manufacturers to smooth their order-books across the demand from several states and in doing so, maintain a long-term viable business. Conversely, a state-based approach may see a new local manufacturing facility set up in one state to deliver a single contract and then wither due to lack of work, while an established facility in another state also falls away due to the inability to access on-going work from interstate. The undesirable result might be that neither facility survives and in the future the rolling stock is imported.

This jurisdictional approach to local content requirements increases the risk of stranded assets and can be seen as a disincentive for investment in the Australian market by international organisations. Moving towards a truly national approach to local content policies will ensure a much more healthy, viable, and sustainable rail manufacturing sector in Australia.

The ARA believes investment attraction would be improved if both the Commonwealth and state and territory governments took a more holistic and national approach to the application of local content policies in procurement processes.

Where products and services are readily available in the Australian market, government procurement processes should ensure these Australian-based suppliers are given preferential consideration. This consideration would assess the broader economic benefits and supply chain certainty that flows from locally based suppliers, enabled through economies of scale.

Recommendation:

5. The ARA recommends the Commonwealth Government take a leadership role to:
   - encourage state and territories to define local content as Australian and New Zealand, to facilitate economies of scale to enable investment.
   - recommend that state-based local content policy should only be permitted when there is no relevant established manufacturing capability in Australia.
   - Coordinate an ongoing and stable pipeline of opportunities across jurisdictions so rail suppliers can have confidence to invest beyond each project and contract.

iii. supply chain support;

Policies and regulations that govern the industry vary significantly state by state. For the supply chain, operating in multiple jurisdictions of Australia is akin to operating in different countries, necessitating an understanding of each jurisdiction's requirements which raises compliance costs. Achieving greater harmonisation within Australia lowers barriers to participation for the local supply chain, enabling sustained operations which can build scale and expertise and opportunities for growth.

Given the practical challenges involved in national rail coordination, and the key role of state governments in delivering and operating rail assets, effort should be focused on achieving broader consistency in policies, regulation and planning across the jurisdictions. The Infrastructure and Transport Ministers' Meetings have begun this process through the establishment of the National Rail Action Plan, however further work will be required in the years ahead to ensure improved coordination across jurisdictions.

Improved harmonisation would support more viable economies of scale for Australian owned businesses, which in turn would foster an environment that allows them to invest and viably compete.

Greater consistency reduces supply chain risk and promotes innovation, research, and the adoption of technologies that will provide sustainable opportunities for Australian businesses to participate and invest in the rail industry.

Recommendation:

6. The ARA recommends that the Commonwealth Government take a more active role in facilitating harmonisation across the state and territories in key areas including standards, requirements, competencies, type approval, pre-qualification, and procurement processes.

iv. government procurement;

Existing investment and procurement processes are highly fragmented, with each state's planning and policy developed in isolation from the other states. Most firms in the Australian rail industry operate across state borders and are therefore in direct competition with other local firms over human and capital resources, a situation which is exacerbated by uncoordinated local content policies, indigenous and workforce requirements, and social requirements. This poses risks to both the number of tenderers, delivery timeframes and quality of supply to Australian rail projects, as well as the growth and sustainability of local firms and jobs.

Ensuring that individual pipelines are developed in recognition of other investment plans allows Australian rail firms to plan, prepare, and coordinate several projects in multiple jurisdictions. Coordination of the project pipeline would also better support industry's capacity to efficiently deliver against government project milestones.

It is also important to acknowledge that the challenges with the fragmented nature of local content policies are exacerbated by the unpredictable way in which governments award extensions to rolling stock projects (and other projects more broadly).

It is the ARA's understanding that in these situations there is often a base contract with extension options, however these extension options are generally not ordered prior to the completion of the base contract. This results in companies needing to stand-down resources and then reinstitute them when the extension is finally awarded. Our members have indicated that the gaps between a base contract completion and the ordering of extension options can be up to two years. This creates significant disruption to the supply chain and heavily impacts the efficiency of project delivery.

The cost of tendering both construction projects as well as procuring rollingstock in Australia is estimated to be double international averages.[4] [5] The costs of reducing these costs would deliver multiple benefits: more bidders would be likely to join the tender process, increasing competitiveness; cutting red tape would see tender processes completed faster; and resources saved in the tender process could be focused on project delivery. Ultimately these costs are borne by taxpayers with rail predominantly procured by Government agencies or Government operators.

[4] Rail Express, The Sustainability of Rail Contracting in Australia, 2012
[5] Deloitte Access Economics, Opportunities for Greater Rollingstock Efficiency, 2013

Given this period of uncertainty due to the global pandemic, governments are faced with tighter budgets while also needing to progress initiatives to stimulate employment. In these difficult circumstances, it is vital that we strive to improve procurement processes with increased clarity, collaboration, and efficiency. COVID-19 should be utilised as the catalyst for change.

It is estimated that $155 billion of rail investment is planned in the next 15 years.[6] This will require specialist skills, at a time of skills shortages, to devote towards the procurement and delivery of projects. This will amplify the need to develop more productive and efficient approaches to procurement. Procurement practices that are resource intensive, expensive, high risk, or likely to be delayed are considered less attractive.

In consultation with rail suppliers, the ARA developed and published a Best Practice Guide to Rollingstock and Signalling Tendering in the Australian Rail industry in 2020, which summarises the principles that would help achieve improved outcomes for both clients and suppliers. Implementing these principles would aid rail procurement efficiencies for both procurers and tenderers, and assist in reducing costs.

The rail industry requires relatively specialist, scarce and high-value technical skills. This is particularly true in the areas of rolling stock and signalling. The typical procurement process requires high levels of access to the most skilled of these specialists. Ensuring a more efficient tender process that minimises the consumption of resources on redundant and non-productive outcomes would also reduce procurement timeframes, reducing costs and releasing industry capacity for delivery of projects. Further, standardised contracting models and risk allocation frameworks for delivery will also reduce tender development and negotiation costs. Creating a consistent and well understood delivery environment will also lead to more successful project delivery outcomes.

Inevitably, the benefits arising from any process optimisation and standardisation are multiplied when adopted across Australia's procurement agencies. The ARA therefore supports the national convergence and practical standardisation of procurement practices across jurisdictions to the greatest extent possible.

A national registration portal that supports pre-qualification, (for example, with expanded functionality of Tenderlink, or Industry Capability Network Gateway, or Aust Roads pre-qualification scheme) could enable suppliers to input information once, so Tier 1 suppliers as well as purchasers can easily identify registered suppliers and access necessary supplier information, including accreditations. Harmonising accreditation recognition across jurisdictions (as well as internationally) will assist in addressing costly inefficiencies.

Type Approvals require new and/or novel technologies to pass through discrete due diligence testing prior to being adopted by railway operators. Significant improvement could be realised in standardising the Type Approval Process across rail networks for the benefit of both the network

[6] BIS Oxford Economics, 2020

operators and the suppliers and manufacturers. Currently, new technology, products and construction/maintenance processes, must pass through each railway operator's specific approval process prior to being rolled out, regardless of whether the technology, product or process has been approved or applied elsewhere. Type Approval with one operator does not currently serve as a 'trust marker' to another rail operator. This adds a further hurdle to those that are developing innovative technology and proposing technology across different networks.

The lack of consistent and equivalent Type Approval processes between jurisdictions and customers lead to significant inefficiencies, costs and potential barriers for contractors and suppliers. There is opportunity to develop a more harmonised approach to Type Approval processes applied through cooperative agreement, on a set of standardised principles and approaches. Addressing the weaknesses of the current Type Approval processes will ensure more resilient supply chains and support the growth of the domestic economy.

Recommendation:

7. The ARA recommends that the Commonwealth Government adopt ARA's best practice principles for all rail procurements and make the application of these principles' conditional on state and territory governments via the National Partnership Agreement, as part of the Agreement's next revision in 2024.
8. The ARA recommends the Commonwealth Government coordinate the establishment of a national registration and pre-qualification program to streamline processes and create efficiencies for suppliers and constructors, as well as procurers.
9. The ARA recommends the Commonwealth Government coordinate the establishment of a national Type Approval Process or at a minimum mutual recognition type approval process and a national register.
10. The ARA recommends that a Procurement Committee for rollingstock and signalling should be established under the National Rail Action Plan.

v. trade policy;

The ARA's primary focus is on ensuring that that we continue to strengthen and build capability and resilience into our local Australian rail supply chain businesses.

However, it is recognised that there is a $155 billion rail project investment pipeline over the next 15 years, some of which will need to be delivered with the assistance of international suppliers. The ARA understands that currently some parts of railway or tramway locomotives, rolling-stock, track fixtures and fittings and mechanical (including electro-mechanical) traffic signalling equipment attract a 5% tariff. The ARA also notes the Australian Government's recent trade deal with the United Kingdom that provides British rail suppliers zero-tariff access to the Australian market.

This zero-tariff trade deal with the UK will improve the appeal of Australian rail projects to suppliers in that region, however it is essential that federal and state governments always ensure there is a strong focus on local content provisions for rail projects.

With the significant pipeline of work and current skills shortages there is capacity in the market for increasing the number of players, however this should not be at the expense of local suppliers and contractors.

Australia's rail supply chain businesses have wide-ranging, world-class capabilities, and high-level expertise which must be supported and provided an opportunity to thrive. Our economic recovery from the pandemic will be strengthened by improving our supply chain resilience through the creation of local jobs, enhancing local capability, and becoming less dependent on international suppliers.

vi. skills and training; and

Trades are central to manufacturing, however with an increasing digital complexity part of rollingstock manufacture in 2021, rail will require skills in systems engineering as well as graduates from degrees such as computer science and mechatronics. Systems integration skills will also be central to rial operations in the future.

Rail has historically suffered from a lack of consistency of skills and recognition of skills across states and territories. In the manufacturing area this is less of an issue, however when testing and commissioning at the end of a manufacturing process, government needs to work with industry to ensure that the required safety qualifications are harmonised across jurisdictions.

Government could assist by supporting the build of training packages in the VET sector that ensure systems integration is a key feature. Similarly, government needs to review relevant trade qualifications to determine whether or not the content within the qualifications is preparing apprentices and trainees for the world of work in the manufacturing space. Robotics and automation are much more a feature of manufacturing of rollingstock than was the case even five years ago.

Government needs to support the newly established National Rail Skills Hub to undertake research that identifies pathways for learners from post school through to all the roles needed in the manufacture of rollingstock.

New skills will be required due to the development of new technologies and innovations to improve network operations, reduce power consumption, smarter monitoring and asset management processes, and advanced safety, threat detection and intervention.

h. the opportunity for reliable, cheap, renewable energy to keep Australia's manufactured exports competitive in a carbon-constrained global economy and the role that our manufacturing industry can play in delivering the reliable, cheap, renewable energy that is needed.

The energy transition for rail will likely involve significant new electrification, albeit likely discontinuous electrification in concert with on-board (battery) energy storage. Electrification infrastructure projects require significant quantities of small-part steel work, bracketry, clamps, etc., all of which have traditionally been manufactured locally.

If Australia's jurisdictions could agree on a single "Australian" basic range of overhead line components, then greater volumes arising from commonality across the states would likely lead to more efficient and sustainable local manufacturing of these parts. In relation to rolling stock, the market for many components must be seen from a global perspective, which will likely see significant global demand for clean energy technologies such as traction batteries.

When considering the future energy mix of the rail network, the role of clean hydrogen power is also likely to play a role. This is likely to be especially true in Australia where there is limited power infrastructure in the regions.

From a rail manufacturing perspective, access to reliable, cheap, renewable energy would ensure manufacturing and operating costs would be minimised. This then puts Australian manufacturers in a more competitive position when participating in the global export market.

It is also worth noting that many of the technical skill sets which are inherent in the rail industry are also applicable to the design, supply and maintenance support of the renewable energy industry. It is now commonplace to see Australian engineering companies expressing their desire to diversify into other industries, whilst maintaining rail as a revenue baseline.

Conclusion

Many of the issues facing the Australian rail manufacturing sector are long-standing and will be familiar to anyone that has had some involvement in the rail industry. There have been numerous reports, inquiries, and recommendations canvassing these issues over the year, such as the '*Opportunities for Greater Passenger Rollingstock Procurement Efficiency*' published by ARA in 2013, '*On track to 2040*' published by the Rail Manufacturing CRC, and previous Parliamentary inquiries.

To date, nothing has materially changed in the policy environment to make rail manufacturing a stronger and more viable industry that can support the delivery of the $155 billion investment pipeline for rail over the coming decade, as well as foster more Australian innovation and export opportunities.

Rail manufacturing, and manufacturing in general in Australia, has evolved significantly from its blue-collar beginnings into a high-technology industry focussed on innovation. There is a significant opportunity to create an industry that invests in skills, research and development, as well as production facilities that can support not just rail but the broader transport, aviation, defence, and clean energy industries.

Now is the time for Government action to commit to broader support for the long-term sustainability and growth of the rail manufacturing supply chain in Australia, which in turn will help drive job growth in the regions, as well as secure our broader economic recovery.

Summary of Recommendations

The following section provides a summary of the key recommendations for the Committee's consideration.

1. The ARA recommends the Commonwealth Government support the establishment of a national rail innovation and research body that: • drives national planning and coordination of investment; • fosters the development of national capability; • provides a collaborative model to support short term commercialisation investment; and • long-term research and development in rail.
2. The ARA recommends the Commonwealth Government consider the development of an incentive scheme for the application of new technologies and innovations to Commonwealth funded infrastructure projects.
3. The ARA recommends the Commonwealth Government ensure its procurement processes support an innovation culture and appropriately value the application of new technologies, particularly regarding sustainability, which is often and unfairly seen as cost prohibitive.
4. The ARA recommends that the Commonwealth Government facilitate the development of a mutual recognition process of type approved products and a national register of products, and methodologies.
5. The ARA recommends the Commonwealth Government take a leadership role to: • encourage state and territories to define local content as Australian and New Zealand, to facilitate economies of scale to enable investment. • recommend that state-based local content policy should only be permitted when there is no relevant established manufacturing capability in Australia. • coordinate ongoing and stable pipeline of opportunities across jurisdictions so rail suppliers can have confidence to investment beyond each project and contract.
6. The ARA recommends that the Commonwealth Government take a more active role in facilitating harmonisation across the state and territories in key areas including standards, requirements, competencies, type approval, pre-qualification, and procurement processes.
7. The ARA recommends that the Commonwealth Government adopt ARA's best practice principles for all rail procurements and make the application of these principles' conditional on state and territory governments via the National Partnership Agreement, as part of the Agreement's next revision in 2024.
8. The ARA recommends the Commonwealth Government coordinate the establishment of a national registration and pre-qualification program to streamline processes and create efficiencies for suppliers and constructors, as well as procurers.

9. The ARA recommends the Commonwealth Government coordinate the establishment of a national Type Approval Process or at a minimum mutual recognition type approval process and a national register.
10. The ARA recommends that a Procurement Committee for rollingstock and signalling should be established under the National Rail Action Plan.