Australian Citizens Party

[redacted]

Website: http://citizensparty.org.au

10 September 2021

Senate Standing Committees on Economics
PO Box 6100
Parliament House
Canberra ACT 2600

Dear Committee Secretary,

RE: Senate Economics References Committee inquiry into the Australian manufacturing industry

Please find attached a submission by the Australian Citizens Party to the inquiry into the Australian manufacturing industry.

We trust this information will assist the inquiry.

Yours sincerely,

Craig Isherwood	Robert Barwick	Jeremy Beck
National Secretary	Research Director	Executive Member

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Submission to Senate inquiry into the Australian manufacturing industry

Introduction

The Citizens Party for over three decades has warned of the plight of Australian manufacturing under globalisation. In its heyday in the late 1950s and early 1960s, Australian manufacturing contributed close to 30 per cent of GDP. Now it's at only 6 per cent. Today manufacturing employs approximately 908,200 persons, which accounts for 6.9 per cent of the total workforce. This figure has steadily declined since the 1970s as neoliberal and radical environmental policies destroyed our once productive economy, leaving a property bubble and a bankers' casino in its place. But for two decades in the post-World War II boom, Australia had close to full employment, and manufacturing jobs accounted for more than 25 per cent of the workforce. We used to make just about everything required for everyday life.

In a volatile and uncertain world, being dependent upon global supply chains for many essential goods places Australia at great risk. We must revive manufacturing and the skilled workforce it demands, to become more self-reliant. Reviving manufacturing will provide rewarding job opportunities, and will inspire a sense of national mission and purpose in producing the means to better people's lives.

1. Lessons of Australia's manufacturing history

1.1 Munitions Supply Board

The history of manufacturing in Australia shows that past leaders had a different outlook to their contemporaries. The case of the Munitions Supply Board (MSB) is exemplary. Controller-General of munitions supply Arthur Edgar Leighton had the forethought that was essential in saving our nation from invasion in World War II. And the MSB's focus on "self-containment" was key to its success.

Created on 13 August 1921 under the Commonwealth Department of Defence, the MSB operated until 1 July 1939, perfectly timed to prepare Australia for World War II. Author of *Armed and Ready: The Industrial Development and Defence of Australia, 1900-1945* Andrew Ross explained the importance of the MSB: "the MSB planned to create the largest scientific industrial research organisation in Australia, and an elaborate factory system in which the most advanced techniques of production engineering and inspection were practised." During the inter-war period, "the MSB developed and controlled the largest and most advanced factory system in Australia", and it also had the largest industrial support laboratories.

Leighton, who headed the MSB for nearly the entire inter-war period, was a highly skilled chemist and manager. He suggested that engineering shops of the Commonwealth could be so organised that they could be readily converted into munitions factories in a time of need. The Commonwealth government under Prime Minister Billy Hughes saw merit in Leighton's proposals of self-containment and in supporting local scientific and technical expertise. This new direction formed a major part of Prime Minister Hughes' May 1922 public statement on the new defence policy. The Munitions Supply Laboratories (MSL), created in that year, acted under the control of the MSB and was the centrepiece of the defence organisation, or its "brain", as Leighton liked to describe it.

On 1 July 1939 Leighton said, "in spite of public apathy, munition-making was developing at a rate that would make Australia a tough nut for any enemy to attack". He was proved right! Later that year World War II commenced, and in 1942 Japanese bombs fell on mainland Australia, yet our forces proved victorious. "In the early days", said Leighton, "we had to check even the sizes of nails to ascertain if they could be bought in Australia. Today 80 per cent of our requirements can be purchased locally."

1.2 World War II

BHP supremo Essington Lewis built upon the work of Leighton as director of munitions in World War II. Following the resignation of Prime Minister Robert Menzies in 1941, Prime Minister John Curtin increased Lewis's power by appointing him director-general of the additional Department of Aircraft Production. The national emergency of war and Lewis's leadership saw a stunning increase in manufacturing under the leadership of Labor prime ministers John Curtin and Ben Chifley.

Aircraft manufacturing is a notable example. During the war Australia manufactured 700 twin-engined Beaufort bombers. Component parts were sub-contracted out to about 600 firms, and seven factories handled the major sub-assemblies that were then fed into the main workshops at Fishermans Bend in Melbourne and Mascot in Sydney.[1] When Japan entered World War II in December 1941, the RAAF did not possess a single fighter aircraft for home defence. But a mobilisation of the nation's resources saw 250 CAC Boomerang aircraft produced between 1942 and 1945.[2] And by the end of 1945, a total of 364 DAP Beaufighters had been manufactured in Australia too.[3]

Australia's massive expansion in manufacturing was truly dramatic. US General Douglas MacArthur would later describe Australia's lack of equipment when he arrived in 1942 as his single greatest shock of the entire war. By the end of the war local industry had become able to manufacture literally anything—especially, and most crucially, machine tools, the "machines that make machines" that are the core of any manufacturing capacity.

1.3 Post World War II boom

Post-war Prime Minister Ben Chifley was determined to consolidate Australia's manufacturing capacity and put it to use developing Australia to build the peace, just as it had so ably supplied the war. He envisioned Australia building great development projects to transform the productive capacity of the nation, starting with the Snowy Mountains Scheme. It was not free market "demand", but Ben Chifley's government which

[1] https://www.airforce.gov.au/sites/default/files/minisite/static/7522/RAAFmuseum/research/aircraft/series2/A9.htm
[2] https://www.airforce.gov.au/sites/default/files/minisite/static/7522/RAAFmuseum/exhibitions/hangar180/boomerang.htm
[3] https://www.airforce.gov.au/sites/default/files/minisite/static/7522/RAAFmuseum/research/aircraft/series2/A8.htm

identified that Australia needed a domestic automotive industry to be the focal point for Australian manufacturing and machine-tool development.

Manufacturing flourished in the 1950s and 1960s, with products including cars, chemicals, whitegoods, electronics, furniture, canning equipment, textiles, clothing and footwear. Expanded capital investment enabled the post-war growth. The value of plant and machinery in factories increased from £336,615,000 in 1950-51 to £1,391,490,000 in 1960-61, an unprecedented 313 per cent increase in a decade.[4]

In 1970 the Gorton government decided to establish the Australian Industry Development Corporation to invest in aluminium smelting, on the basis of a Cabinet submission which showed that in 1970 dollars, exporting one million tonnes of bauxite earned $5 million; processed into alumina, it earned $27 million; processed into aluminium ingots, it earned $120 million; and processed into finished aluminium products, it earned $600 million! This was when Australia was committed to manufacturing to take advantage of our immense raw materials wealth; which commitment Hawke, Keating and Howard shredded in their mad embrace of neoliberalism and free trade, degrading our economy into a colonial-style raw materials exporter.

1.4 Neoliberal economic consensus

The floating of the Australian dollar in 1983 and the following neoliberal economic reforms, including the privatisation of the Commonwealth Bank and many other national assets, contributed to the decades-long decline of Australia's manufacturing industry. Described by Labor's Prime Minister Julia Gillard in October 2010 as the "post-1983 consensus on economic reform", the reality of its failure should be obvious to all but stubborn ideologues.

The early 1990s recession hit Australian manufacturing hard. Between August 1989 and August 1993 the nation suffered 137,000 job losses in manufacturing employment, or 11.7 per cent.[5] The Labor Party's Paul Keating, treasurer in 1983-91 and prime minister in 1991-96, proclaimed it "the recession we had to have". But this recession was not inevitable at all. Rather, it was part of a deliberate strategy to deindustrialise Australia and centre the economy around services and finance. This is precisely what Keating intended when he proclaimed in 1985 that Australia should be the "Wall Street of the South".

Under Keating, tariff cuts in the 1980s and '90s destroyed the ability of Australian companies to manufacture at Australian wages. For an insight into the flawed ideology behind the destruction, see how Keating justified his policies in a 26 November 2013 interview with Kerry O'Brien on ABC-TV.

O'Brien asked, "Looking now at the state of manufacturing today: the rustbelts around the major cities; industries like cars and steel and shipbuilding still in trouble; so many skills lost, jobs exported to Asia; are you still sure it was the right thing to do the way you did it?"

Without hesitation, Keating replied, "Oh, absolutely! I mean, it advanced us donkey's years…."

Pointing to the human toll, O'Brien countered, "But many of those working people were now staring at lost jobs. Many of those working people in factories, in various jobs, skilled, semi-skilled, unskilled—gone."

"Yeah—gone", Keating responded defiantly. "You know what they found? A better job a week later, in a growing economy, with employment growth."

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[4] *Year Book Australia 1965*, Australian Bureau of Statistics, p. 148.

[5] https://cdn.aigroup.com.au/Economic_Indicators/Economic_Outlook/Australian_Manufacturing_in_2019.pdf

Keating's brazenness left O'Brien gobsmacked. This period was the beginning of a rise in unemployment that eventually peaked at over 11 per cent, and only came down through statistical manipulation and the permanent shift from full-time unionised jobs to part-time and casual jobs. O'Brien said, "You make it sound so simple: 'a week later they had another job'! Do you really think that's how it worked out?"

"We got them off the factory floor", Keating responded. "The aim was not to leave them doing repetitive jobs on the factory floor, but to get them off the factory floor doing better professional jobs *in the big service economy of Australia*. I mean, all these people got picked up." (Emphasis added.)

In truth, the services jobs that replaced manufacturing did not create wealth, but rather just moved it around. Consequently, Australia has been unable to pay its way, as evidenced in the meteoric rise of gross foreign debt over the past three decades from $147 billion in 1988 (43 per cent of GDP), to more than $2,442 billion ($2.4 trillion—128 per cent of GDP) by June 2021. Such a dependence on foreign debt puts us at the mercy of global economic events.

Prior to the neoliberal post-1983 economic consensus, workers employed in manufacturing industries could support a family on an average wage and be proud of making products which we all used. Now finance has flowed into asset price inflation in a housing bubble instead of into manufacturing. Consequently, an average wage can no longer support a family; even many dual-income families are struggling to meet bills and mortgage repayments.

2. Finance and investment

2.1 Commonwealth National Credit Bank

Reviving Australian manufacturing will require at least hundreds of billions of dollars in capital investment over the next decade. In the 2020-21 financial year, total business investment in Australian manufacturing was $10.2 billion.[6] This is 0.49 per cent of GDP. By contrast, in 1963-64 capital investment in the manufacturing industry amounted to £296,100,000,[7] 2.79 per cent of GDP.[8] Total capital investment into manufacturing must expand severalfold on the measly current expenditure to achieve a genuine manufacturing renaissance. This will not occur if left to the current financial markets. Government must return to a role in banking.

The Citizens Party has drafted legislation for a new national bank, the Commonwealth National Credit Bank (CNCB), modelled on the original "people's bank", the Commonwealth Bank, when it functioned at its greatest effectiveness in WWII.[9] The CNCB will have eight divisions, including one specifically for assessing the need for and arranging the issuance of credit for the manufacturing industries of Australia.

The CNCB establishes a Bank which is responsible to Parliament, instead of to the private individuals who currently run the Reserve Bank; and mandates that the Bank function in such a manner as to cause a "rise in the physical output of the nation" and increasing "the rate of introduction of new technologies into the

[6] Australian Bureau of Statistics, 5625.0 Private New Capital Expenditure and Expected Expenditure, Australia.

[7] "Investments aided export boom", *The Canberra Times*, 23 Nov. 1964, p. 3.

[8] Australian Bureau of Statistics, 5206.0 Australian National Accounts: National Income, Expenditure and Product.

[9] https://citizensparty.org.au/policies/banking-finance/national-banking

economy". Precise measures to calculate such rises are specified, so that the Bank has no choice but to so function, or an investigation is mandated.

The CNCB manufacturing and industrial finance division will facilitate and encourage, provide advice, assist, and provide finance for the establishment and development of industrial undertakings, particularly small undertakings. We need to promote and build up small manufacturers that are very diverse. Unlike the other divisions, there shall be a general manager of the manufacturing and industrial finance division, who shall be appointed by the CNCB Governor and shall hold office as determined by the governor. This particular Division requires a manufacturing background and familiarity with industrial processes, not a banking background.

2.2 Commonwealth Postal Savings Bank

The Citizens Party proposes that a national postal savings bank would operate in tandem with the Commonwealth National Credit Bank. The postal bank would invest any surplus funds in the CNCB, which investment would also be fully government guaranteed. Australians who deposit their savings in the national post office bank would therefore know that not only are their savings safe, but they are being used for the economic development of Australia.

3. Government support for manufacturing

3.1 Tariff protection

Tariff protection ensured the viability of Australia's manufacturing industry for decades. Tariff rates for passenger motor vehicles increased to a peak of 57.5 per cent in 1978 and remained at that rate until 1987. It was largely the cutting of the tariff rate which led to the demise of Australia's car manufacturing industry. Many others in manufacturing suffered the same fate.

Ostensibly, tariff cuts were intended to help Australian manufacturing succeed in a globally competitive market. For example, "reducing the passenger motor vehicle tariff to 5 per cent by 2010, making Australian car tariffs the *third-lowest amongst major automotive-producing economies in the world*" was a key recommendation of the Commonwealth Government's 2008 *Review of Australia's Automotive Industry*.[10] The report claimed this tariff cut would "enable the Australian automotive industry to be *world-competitive and viable*". In truth, this policy helped eliminate the entire industry nine years later. (Emphasis added.)

Prime Minister Ben Chifley initiated advanced manufacturing in Australia, but it only lasted and flourished as long as it did because the great Country Party leader John "Black Jack" McEwen fought for "protection-all-round". In the post-World War II period, tariff protection was widely acknowledged to help Australian industry. An article in *The Age* of 19 April 1955 headlined "Tariff Protection Has Brought Us Prosperity" opened as follows: "The amazing growth of secondary industries in Australia is a direct result of effective tariff protection against highly industrialised countries who might seek to swamp our local market with manufactured goods."

The article listed many good reasons for a protective tariff policy, including:

- To promote new industries and employment;

[10] Bracks, S. *Review of Australia's Automotive Industry: Final Report*, 22 July 2008, (Canberra: Commonwealth of Australia).

- To protect wages and labour conditions against countries with lower wages and standards of living, and thus ensure full employment in Australia;
- To stabilise production by promoting industries which can take up any seasonal unemployment;
- To free the country from dependence upon overseas supplies during war.

The same reasons apply today. Tariff protection is merely a tax on imports. It's ironic that the Liberal Party leaders and free trade advocates, John Hewson and John Howard et al., while arguing to reduce one form of tax—tariffs—campaigned with such vigour to introduce another tax—the GST.

3.2 Bounties

While tariffs will protect manufacturing from foreign imports, bounties are an important tool for government to foster manufacturing and incentivise investment in specific areas. The Australian Constitution, Section 51 (iii) gives the Parliament legislative power to pay bounties on the production or export of goods. In addition, Section 91 of the Australian Constitution allows States to do the same.

Examples of past bounties show what is possible today. The *Manufactures Encouragement Act 1908* (no longer in force) was enacted to encourage specific manufacturing by way of a bounty payment from the Commonwealth's Consolidated Revenue Fund. Bounties payable under the Act included 12 shillings per ton of steel made from Australian pig iron, and 10 per cent on the value of tubes or pipes made from Australian pig iron or steel.

While tariffs are useful to protect existing manufacturing, government may employ bounties to encourage and support new manufacturing business start-ups. The use of bounties in this way could be targeted to advance new high-tech manufacturing which needs initial assistance to ensure its long-term viability.

3.3 Government procurement

A government mandate to procure Australian manufactured goods where possible would make a big difference to boost the nation's manufacturing industry. Government is among the nation's biggest spenders. Prior to 2019-20, Australian Government expenditure ranged from around 24 per cent to just over 26 per cent of GDP, averaging 25.1 per cent of GDP and peaking over this period at 26.2 per cent in 2009-10. The economic response to COVID-19 has seen expenditure skyrocket in 2019-20 to 29.2 per cent of GDP, and it is expected to peak at 34.4 per cent of GDP in 2020-21.[11] Such expenditure capacity could make a huge contribution in boosting Australian manufacturing if procurement mandates were in place.

4. Energy

Manufacturing flourishes with low-cost and reliable energy. A scientific approach cannot ignore energy flux density. For example, there's a good reason why hydropower wins hands down over wind power. Both extract kinetic energy from a moving fluid directly proportional to the fluid's density. But whereas water has a density of 1,000 kg per cubic metre, air has a density of only 1.2 kg per cubic metre. Add to that the potential energy of a head of water, and the density of energy flow is magnitudes higher in a water turbine than a wind turbine. Similarly, an ultra-supercritical boiler can deliver a main steam pressure of greater than 27 MPa and a

[11] Hawkins, P. "Australian Government expenditure", Budget Review 2020-21, ISSN 2203-5249, October 2020. (https://parlinfo.aph.gov.au/parlInfo/download/library/prspub/7622081/upload_binary/7622081.pdf).

steam temperature of above 580 °C. This produces an energy flux density that is magnitudes higher than the puff of air past a wind turbine.

Many manufacturing firms operate 24 hours per day to ensure full utilisation of capital. The economics of expensive machinery sitting idle for 16 hours per day doesn't always stack up. It is therefore paramount that reliable electricity is available 24 hours per day. Intermittent power from wind turbines and solar panels fails to fulfil this requirement, and storage of energy such as in batteries is prohibitively expensive.

In the heyday of Australian manufacturing, coal-fired and hydroelectric power stations ensured abundant, cheap power. As at 30 June 1967, thermal power represented 71 per cent, hydroelectric power 26 per cent, and internal combustion equipment 2.5 per cent of the total installed generating capacity.[12] But in the following decades, policies ostensibly to reduce greenhouse gas emissions have transformed the nation from having among the cheapest electricity prices in the world to among the most expensive.

In 1970, Minister for National Development Reginald Swartz stated: "Australia, indeed, is fortunate in having large supplies of low-cost coal. By siting thermal stations near coal mines and through economies of scale in generation, New South Wales and Victoria have been able to produce electricity at *among the lowest cost in the world*."[13] (Emphasis added.)

In the 10 years to June 2013 real electricity prices for manufacturing businesses rose by 60 per cent.[14] In the following years the situation only deteriorated. An article in the 7 March 2017 *Australian Financial Review*, "Manufacturers slugged by power price hikes" referred to massive electricity price increases hitting manufacturers. The article referred to several examples of businesses being hit by electricity price rises. Here are just two of note:

> "Hardware manufacturer Alchin Long Group in Sydney's west has had to agree to a near-doubling of its electricity price and may re-think plans to shift work back to Australia from China as a result, said Graham Lee, national operations manager. The price of the new two-year contract from Origin Energy has surged from $55.30 per megawatt-hour to $109.70."
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> "Packaging group Orora has seen a doubling in electricity and gas prices in the past 12-18 months forcing it to review where it does business, said chief executive Nigel Garrard. 'If you run a business over a number of different countries as we do you have got to look at your cost of operations and where you are going to put your manufacturing', Mr Garrard said."

Electricity price rises are a product of price-gouging in a rigged electricity market with a ridiculously high $15,000 per megawatt hour price cap, in combination with a reliance on expensive intermittent wind and solar power. This rigged market and flawed energy mix must end to ensure manufacturing has cheap reliable power. Australia must reject the "energy saving" mentality and return to a vision of progress and expansion of per capita energy consumption.

The 1968 *Year Book* of the Australian Bureau of Statistics stated, "future electric power plants on the mainland of Australia will be predominantly thermal or thermo-nuclear installations, and in an electrical system in which the greater part of the energy is generated in thermal plants it is usually found that the hydro

[12] *Year Book Australia 1968*, Australian Bureau of Statistics, p. 1131.

[13] Swartz, R.W. "Power: energy in a nation's life", *The Age*, 27 July 1970.

[14] https://aph.gov.au/about_parliament/parliamentary_departments/parliamentary_library/pubs/briefingbook44p/energyprices

installations operate to the best advantage on peak load". If only this were true today, Australia would not be facing an energy crisis of unreliable and expensive electricity.

4.1 Nuclear power

The terms of reference for this inquiry refer to "the opportunity for reliable, cheap, renewable energy" for Australian manufacturing. The only reliable and cheap renewable energy used in Australia today is hydropower. But contrary to misconceptions, nuclear power is completely renewable. Scientist James Conca made this point in a 1 July 2016 article, "Uranium Seawater Extraction Makes Nuclear Power Completely Renewable", published in *Forbes*.[15]

"Nuclear fuel made with uranium extracted from seawater", writes Conca, "makes nuclear power completely renewable. It's not just that the 4 billion tons of uranium in seawater now would fuel a thousand 1,000-MW nuclear power plants for a 100,000 years. It's that uranium extracted from seawater is replenished continuously, so nuclear becomes as endless as solar, hydro and wind."

An article by reactor physicist Dr Nick Touran, "Nuclear fuel will last us for 4 billion years", explains the truth of nuclear power's long-term future.[16] "By any reasonable definition," writes Touran, "nuclear breeder reactors are indeed renewable." He continues to explain how breeder reactors with a recycling fuel cycle can utilise known uranium and thorium deposits. And the 65 trillion tonnes of uranium in the Earth's crust continuously replenishes the uranium in seawater through runoff, and plate tectonics.

Nuclear power will provide Australian manufacturing abundant, cheap, clean energy which is a bonus for the economy and the environment. Australia has practically inexhaustible reserves of uranium and thorium, both of which are magnitudes more energy-dense than coal, oil and gas.[17] Thorium is an estimated 200 times more efficient a fuel than uranium.[18] It's this energy density which makes the economics of nuclear power so favourable. Australia must repeal all legislative bans on nuclear power and immediately join the 19 nations which currently have nuclear reactors under construction (August 2021).[19]

5. Nation-building with grand infrastructure projects

Building grand infrastructure projects will provide many opportunities for Australian manufacturing. Components required for infrastructure during the construction phase will require a vastly expanded manufacturing sector. Completed infrastructure will complement the manufacturing sector by providing more efficient supply chains.

5.1 Ring Rail and national port in Darwin

Australia's rail sector must be revolutionised, both for the sake of domestic transportation and to tie Australia into the rest of the world, in particular into the world's greatest population centres in East and Southeast

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[15] https://www.forbes.com/sites/jamesconca/2016/07/01/uranium-seawater-extraction-makes-nuclear-power-completely-renewable/?sh=68fd1cc159ae

[16] https://whatisnuclear.com/blog/2020-10-28-nuclear-energy-is-longterm-sustainable.html

[17] https://world-nuclear.org/information-library/facts-and-figures/heat-values-of-various-fuels.aspx

[18] https://www.txthorium.com/

[19] https://world-nuclear.org/information-library/facts-and-figures/world-nuclear-power-reactors-and-uranium-requireme.aspx

Asia. The late Prof. Lance Endersbee's *The Asian express: a proposed fast freight service to Asia*, published in 1994,[20] proposed a fast-freight inland rail to open Australia up to the largest emerging markets in Asia. In combination with high-speed shipping from a national port in Darwin, fresh perishable agricultural produce could be sent to Asian ports, something not possible with existing transport options.

The existing Darwin Port will require major infrastructure upgrades to handle imports and exports which will traverse to and from the port via high-speed railways across the national economy. This investment will pay for itself many times over via reduced delivery times and other efficiencies.

Prof. Endersbee's Asian Express from Melbourne to Darwin had links to Sydney, Brisbane, Gladstone and Alice Springs. In 1997 he expanded it to an Australian Ring Rail Proposal to link up to Western Australia, all the way to Perth. Minimally a conventional high-speed Asian Express and Ring Rail should be prioritised over the slow 115 km/h Inland Rail plan from Melbourne to Brisbane. Such a rail corridor should be wide enough to accommodate passenger transport and freight simultaneously.

High-speed freight will assist Australian manufacturing in significantly reducing delivery times. Manufacturing high-speed train carriages also presents an opportunity. China is leading the world in this area and it would be foolish for Australia to be left behind with trains of yesteryear. RailFreight.com reported 5 January 2021 that the Chinese train manufacturer CRRC Tangshan has just released the fastest freight train in the world. It's designed to carry cargo at a speed of 350 km/h and the new design rolled off the production line in Tangshan, in north China's Hebei Province, on 23 December 2020.[21]

5.2 Vacuum maglev

China's *Global Times* reported 15 August 2021 that construction will soon start on the test line for a 1,000 km/h maglev train.[22] The project, to be launched in Datong, northern Shanxi Province, uses superconducting magnetic levitation technology in a vacuum tube to reduce air resistance. Similar maglev technology is being developed in other nations under the Hyperloop system.

More ambitious speeds will be possible in future. Engineers Professor Emeritus Ernst Frankel and Dr Frank Davidson have proposed a neutrally buoyant vacuum tunnel submerged 45 to 90 metres beneath the Atlantic Ocean surface (avoiding deep ocean pressures) and anchored to the seafloor, through which a magnetically levitated train would speed at up to 6,500 km/h.[23] Travel from Europe to the United States would take about an hour. The late Professor Frankel was a Professor of Mechanical and Ocean Engineering at MIT, and the late Dr Davidson is known as the father of the English Channel tunnel. "From an engineering point of view there are no serious stumbling blocks," said Professor Frankel. "We lay pipes and cables across the ocean every day."

The terms of reference of this inquiry refers to "identifying new areas in which the Australian manufacturing industry can establish itself as a global leader". It's a bold idea, but Australia has an opportunity to start a global transport revolution in manufacturing ultra-high-speed maglev evacuated tube transport.

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[20] Endersbee, L. (1994) *The Asian express, a proposed fast freight service to Asia*, Australian Academy of Technological Sciences and Engineering.

[21] https://www.railfreight.com/railfreight/2021/01/05/new-claim-for-fastest-freight-train-in-the-world-350-kmph

[22] https://www.globaltimes.cn/page/202108/1231521.shtml

[23] https://www.popsci.com/scitech/article/2004-04/trans-atlantic-maglev/

Travelling at speeds exceeding 6,000 km/h and ending the tyranny of distance provides an inspiring mission. Australia could be the first nation to achieve this feat, and the doubting cynics would end up in the camp of Lord Kelvin, President of the British Royal Society who in 1895 said, "heavier-than-air-flying machines are impossible". Our vast distances between capital cities; the extensive flat terrain of the Nullarbor Plain providing distance to build up to ultra-high speeds; and the prospect of an under-sea route to Tasmania, Papua New Guinea and Indonesia, make Australia the ideal nation to show the rest of the world what is possible.

5.3 Iron Boomerang

Australians should embrace Project Iron Boomerang, a plan to connect northern Queensland's coalfields to northern Western Australia's iron ore reserves with a railway that transports the minerals both ways, supplying steel mills at both ends. This project would fully capitalise on Australia's abundant iron ore and metallurgical coal reserves, and could be the cornerstone of the infrastructure development program Australia needs to engineer an economic recovery.

The Project Iron Boomerang website describes the plan as "a transcontinental multi-user rail infrastructure corridor and steel manufacturing complex which will revolutionise global steel manufacturing".[24] The project's founder, engineer Shane Condon, says his inspiration was BHP's development of world-leading steel manufacturing in the early 20th century by establishing plants at Whyalla, adjacent to South Australia's iron ore reserves, and Newcastle, close to NSW's coal fields, and shipping iron ore to Newcastle and coking coal on return trip to Whyalla.

Condon estimates that Project Iron Boomerang would be able to export 44 million tonnes of first-stage steel slabs per annum, and the process will be 20 per cent more efficient than in China. Expanded Australian manufacturing and grand infrastructure projects would also demand significant volumes of steel, so the Commonwealth Government could assist in providing additional capital to expand Iron Boomerang's capacity.

5.4 Water infrastructure

Major water projects such as a revised Bradfield Scheme in Queensland and a Clarence River Scheme in New South Wales, as proposed by Prof. Lance Endersbee, would create many jobs in the manufacturing sector. During the construction phase manufacturing of pipes, floodgates, hydroelectric generators etc., would be required. Once complete the major water projects will create new and continued economic activity, just as the Snowy Mountains Scheme did.

6. Agriculture and fisheries

Many new manufacturing opportunities will arise with expanded agriculture and fisheries. New major water projects will open vast areas of irrigated land which are presently barren deserts. Australian manufacturing of farm machinery will be one of many areas for new jobs. Tractors, mowers, slashers, harvesters, aerators, sprayers, etc., all can be made locally. The list is almost endless! Australian companies such as Agrifarm and FarmTech already manufacture many of these products. They could expand and other new companies will emerge.

[24] https://www.ewlp.com.au/

Food canneries provide a good example of what is possible. In their heyday they provided good jobs in prosperous regional communities. Then neoliberal economic doctrine forced their closure in favour of cheaper foreign canned food, causing great suffering to farmers and rural communities. As one of the nation's few remaining canneries, SPC at Shepparton in Victoria has reported a massive upswing in demand as people see the benefits of canned fruits and vegetables. Panic buying amid COVID lockdowns aside, SPC Chief Executive Robert Giles told local newspaper *The Adviser* on 7 April 2020 that he sees a longer-term revival of canned fruits. "As we pass through this thing (the Coronavirus), many people are going to be feeling the crunch economically", Giles said. "So we will see a big return to canned produce."[25]

Fresh and canned seafood also provides an enormous opportunity for expanded food processing and associated manufacturing. Australia is presently a net seafood importer, which makes no sense for a nation with such a vast coastline and territorial waters. We produce around 230,000 tonnes[26] of seafood per year, whereas the latest UN Food and Agriculture figures show Thailand's total fishery production in 2018 was a massive 2.598 million tonnes![27] Thailand's Exclusive Economic Zone (EEZ) is only four per cent that of Australia's, and its continental shelf area, which provides most of the catch, is 10 times smaller!

Perth-based Mendolia Seafoods prides itself on its "gourmet seafood, 100 per cent caught and packed in Australia". The company packs sardines, tuna and salmon caught in the "pristine waters" off Fremantle, Western Australia, for the domestic market. With government assistance, such a business model will see a revival of Australian fisheries and seafood processing companies.

7. Training a skilled workforce

The Citizens Party has had extensive dialogue with industry veterans who understand the education and training needed to revive manufacturing. For example, Alan Baker, a veteran TAFE teacher of fitting and machining, explained his experience in advanced engineering technology such as Computer Numerical Control (CNC) machines. He was also involved in writing the syllabus and handbooks used to teach skilled workers. In an email to the Citizens Party, he explained how successive governments have desecrated the TAFE system.

"Please understand", states Baker, "that before you can get manufacturing back and running, this will not happen simply by building factories and tooling up with some modern machinery then expecting it to start producing. You need a *skilled workforce* and neither side of the political divide wants this to happen. They have desecrated the TAFE system right across Australia and it is an osteoporotic skeleton of what it used to be. I know because I worked in it when it was good and watched it deteriorate over years because of interference by people who don't have a clue. Writing this has upset me a lot but you have to know."

Australian TAFE colleges—for the "technical and further education" of adults—have their roots in Mechanics' Institutes that originated in the United Kingdom in the late eighteenth century and spread across the world.

Two hundred people attended the opening of the Sydney Mechanics' School of Arts (SMSA) on 22 March 1833, some of them preparing to teach at the institution. They had been brought to Australia by the great republican and later member of NSW parliament, Scottish immigrant Rev. Dr John Dunmore Lang. Keenly aware of the lack of skilled labour to build the nation, and with no educational institutes to train them, Lang

[25] https://www.sheppadviser.com.au/cans-are-cool-again/

[26] https://www.agriculture.gov.au/fisheries/aus-seafood-trade

[27] FAO. 2020. *The State of World Fisheries and Aquaculture 2020. Sustainability in action*. Rome. https://doi.org/10.4060/ca9229en

sailed home to organise the emigration of skilled Scottish citizens, including mechanics, stonemasons, artisans, carpenters, weavers and builders. This became the first assisted immigration to Australia.

The Sydney Mechanics' School of Arts combined the teaching of literature, history and the arts with vocational training for carpenters, bricklayers, stonemasons and blacksmiths. According to the SMSA website, this expanded over time to include everything from pneumatics, the art of ancient oratory and ship-building, to how to choose a horse and even "simple surgery".[28]

Clearly, the Mechanics' Institutes in Australia provided a very broad education to uplift the citizenry. TAFE colleges extended this broad education to an extent, but in recent decades this broader education has disappeared with the rise of neoliberal economics. This must be overturned to ensure a future manufacturing workforce has creative thinkers. Baker expanded on this point: "Remember that both major parties see education as a direct cost now rather than an investment in the future. TAFE must revert to being the leveller rather than teaching specific skills. Industry simply wants to abdicate its responsibility to train for specifics. You must also remember that just because your company does not use certain skills that those skills are not required in another company along with the processes, and this is what TAFE should be for: to supplement industry rather than do industry's job."

8. Belt and Road Initiative

Australian manufacturing can benefit from participating in the world's largest infrastructure program, the Belt and Road Initiative (BRI). Between January and June this year, China's goods trade with countries and regions along the Belt and Road rose 37.9 per cent year-on-year to reach US$824.55 billion. Contracted BRI projects worth US$39.35 billion were completed in the first six months of 2021, a 10.6 per cent year-on-year increase, reported the *International Railway Journal* on 20 August 2021.[29]

A new expanded national port in Darwin will assist Australian manufacturers to trade with Asia to support the BRI. This collaboration can be a win-win arrangement. For example, Australian manufacturers can supply Asian nations components for BRI projects, and in turn China and other nations can assist in supplying necessary goods and expertise to support Australia's infrastructure development.

9. New technologies

Australian manufacturers have opportunities to expand into emerging technologies. Some examples are:

- Nanotechnology;
- Pebble-bed Modular High-Temperature Gas-cooled Reactors (MHTGR);
- Liquid Fluoride Thorium Reactors (LFTR);
- One brilliant invention that has already been patented, waiting for the development of nuclear fusion, is called the fusion torch: a superheated plasma furnace attached to a fusion reactor, into which all the daily garbage of a city can be dumped, where the material will become disassociated into its component atoms and spat out as pure elements of silicon, iron, et cetera.

[28] https://smsa.org.au/about/history/

[29] https://www.railjournal.com/freight/chinas-goods-trade-along-the-belt-and-road-reaches-us-824-55bn/