



Special Article

The Economic Consequences of Mr Trump and Mr Biden

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Abstract

Max Corden and Ross Garnaut published 'The Economic Consequences of Mr Trump' in this journal in 2018. This paper examines what has transpired in the US economy against that article. It notes continuity in budget and trade policy from the Trump Presidency to the Biden Presidency. The continuity in macro-fiscal and trade policies is accompanied by a significant departure in the focus of fiscal expansion: Mr Biden's strong support for decarbonisation. The article applies Max Corden's approach to international economics to the question: should Australia emulate Mr Biden's combination of budget, protection and decarbonisation policies?

1. Introduction

Max Corden's most recent publication is his 2018 joint article with me in the *Australian Economic Review*, 'The Economic Consequences of Mr Trump'. If we were writing today, the title might be 'The Economic Consequences of Mr Trump and Mr Biden', as there has been continuity across the two presidencies in the fiscal and trade policies that we discussed five years ago. President Biden in practice has taken the Trumpian combination of increasing budget deficits and trade protection a step further in his Inflation Reduction Act (IRA), while increasing incentives for decarbonisation of the US economy.

This lecture in Max Corden's honour applies Max's approach to analysing economic problems to one big question: should Australia emulate Mr Biden's IRA and the policies in which it is embedded?

Max has been the economics profession's teacher. His published work and his lectures have always been models of clarity and precision. His book *Trade Policy and Economic Welfare* half a century ago precisely and clearly set out nearly the whole of what is important for policy in economic thinking about international trade (Corden 1974). His *Inflation, Exchange Rates and the World Economy* 46 years ago applied the best of international macro-economic theory to understanding the new problems of a world disrupted by floating exchange rates and shocks from suddenly higher energy prices (Corden 1977).

*University of Melbourne, Victoria 3100, Australia; email <ross.garnaut@unimelb.edu.au>. This is an edited version of the 2023 Corden Lecture given at the University of Melbourne. Editor's note: The lecture was delivered just 10 days before Max Corden's death on 20 October 2023. He was 96. With Max's passing the world has lost one of its most influential and most respected economists. In this article, Ross Garnaut, who was a close friend and colleague, provides insights into Corden's approach to economics.

Max has always worked on the big economic issues of the day in the real world. His focus on protection and trade policy in the first two decades of his career was directed by the central Australian economic policy question of those days. His shift in focus at Oxford in the 1970s to unemployment and inflation in a world of disrupted global energy markets was to consider the big practical questions of that time. Over the past decade he has taken a close interest in climate change and decarbonisation.

In Max's early years at the Australian National University (ANU), when he was working on protection in the 1960s, I knew him as a teacher as well as a stimulating author and presenter about protection. On his return to ANU after Oxford, we were colleagues with shared interests in Australian and international macro-economic policy. After Max's return from Johns Hopkins and my move to Melbourne one and a half decades ago, I have known him as a close friend with shared interests in, and concerns about, the governance of our country and the world, alongside our longstanding economic policy interests.

In launching Max's autobiography *Lucky Boy in the Lucky Country* (Corden 2018), I described Max as a conservative liberal social democrat. For small minds, these four words together mean nothing in particular. In Max's case, each of the words adds content to a precise and rich concept. A democrat, because in the end public choice should give similar weight to the preferences of all people. A social democrat, because society works better for its members if the state intervenes to raise the living standards of its poorer members. And in any case, democracy does not work in practice unless there is reasonably equitable distribution of incomes and access to the civilising services. Liberal because the preferences and freedoms of individuals of all ethnicity, beliefs and circumstances should be respected and defended against the preferences or decisions of a democratic majority when these threaten to oppress individuals and minorities. And conservative, because, if poorly considered, large change carries risks

of unhappy unintended consequences, and because people prefer change from established conditions to be gradual and comprehensible.

The conservative, the liberal, the social and the democrat have all been front of Max's mind through this last Melbourne decade. During this decade, Max's mind turned more to his first decade, as a boy in Germany. He has identified as part of a German centre that could not hold against the assertion of extremes. He was deeply disturbed by the rise and rise of Donald Trump, but took comfort from Trump lacking the strategic focus and intent of 'him'. But what if a more disciplined and focused leader should come to power with the political views and values of Mr Trump?

1.1 *The Economic Consequences of Mr Trump*

Max maintained his characteristic self-discipline in his only writing about Mr Trump, our article in the *Australian Economic Review* (Corden and Garnaut 2018). Never write about anything in which you are not deeply expert. That has been his creed and practice. And when you write about that, be clear and precise; mean exactly what you say; and make sure that your readers have no doubts about what you are saying.

We noted in that article five years ago that the Trump administration had implemented two major initiatives in economic policy: cutting rates of corporate and personal income tax, leading to an increase in the budget deficit; and increasing barriers against imports. The increased protection was greatest against countries with which the United States had large bilateral trade deficits, notably China. These initiatives were meant to reduce US trade deficits, increase growth in the US economy as a whole, and especially to increase employment and incomes of workers employed in manufacturing in the 'rust belt' states. We sought to answer the question: what will be the effects of these policies?

The consequences of Mr Trump's large tax cuts funded by a larger budget deficit are primarily macro-economic. This initiative

affects broad economic aggregates. The consequences of the increases in protection are essentially micro-economic, affecting the allocation of resources across different economic activities.

The Trump policy changes came after a long, slow but reasonably steady increase in US economic activity and reduction in unemployment after expansionary monetary policies were adopted during the Great Crash of 2008. At the time of Trump's election, the budget deficit had been falling with economic expansion but remained high for the advanced stage of the business cycle and the relatively low unemployment. Public debt as a ratio to GDP had by 2018 reached levels unprecedented except in wartime or its immediate aftermath. Easy money after the Great Crash of 2008 had supported a relatively low dollar exchange rate. This helped US export industries, but left a persistent trade deficit. The low interest and exchange rates assisted a moderate expansion of manufacturing employment including in the rust belt industrial states from about 2010. This followed more than two decades of decline of manufacturing employment accumulating to over 40 per cent from 1988. Unemployment had fallen to the lowest level for nearly half a century.

Our paper noted that an increase in the budget deficit and public debt to fund reductions in tax rates leads to an increase in domestic expenditure. Since there is near full employment, the increase in expenditure leads to an increase in inflation and the trade deficit. The monetary authorities respond to higher inflation by raising policy (shorter-term) interest rates. Higher inflation causes market (longer-term) interest rates to rise. Higher interest rates attract capital inflow and place upward pressure on the nominal exchange rate. An appreciation of the real exchange rate—from the combination of increased prices and an increase in the nominal exchange rate—causes an increase in the trade deficit. Total employment remains about the same as before the fiscal expansion, because the starting point is full employment. Employment falls in industries producing tradeable goods and services in competition with other countries,

including most manufactured goods. It rises in industries producing non-tradeable goods and services.

Mr Trump wanted to reduce US trade deficits with China and the world as a whole through restrictions in imports. We noted that the cost of protection is felt by both potential exporters and potential importers. If the United States imposes tariffs on imports from China, it hurts not only China but also the United States itself. If China then reciprocates by itself restricting trade, it increases the hurt to both countries.

We noted that trade balances are determined by macro-economic factors and not by protection policies, which affect the allocation of resources across industries. Mr Trump wanted to reduce the trade deficit by protectionist policies, but his macro-economic policies were in the way. In the United States, investment was greater than savings and in the rest of the world combined savings were greater than investment. One element of the low savings of the United States was the Trump-determined fiscal deficit.

A trade surplus reflects a tendency for people in a country to value savings more than domestic investment at prevailing interest rates. A deficit in another country reflects a tendency there for people to value investment more than savings. That one country runs a trade deficit and another a surplus may reflect differences between the countries in demography, time preferences or stages of development reflected in differences in opportunities for domestic investment. For the United States, there is little risk that large borrowing from abroad will create financing problems and a financial crisis in the early future, so the matter can be considered as one of preferences. For smaller countries that do not issue the world's international currency, the level of savings relative to investment is not merely an expression of a preference on those matters. Decisions about appropriate levels of borrowing in smaller countries must also take financial stability into account.

Several international reactions to the increase in US protection are possible. Foreign governments may choose not to react. They

may choose to reduce their own trade barriers, either to persuade Mr Trump that he should now desist from his own increases in protection, or to increase gains from trade to offset losses from the change in US policy. They may retaliate by raising their own trade barriers, in the hope of forcing a reversal of American policy—or simply to persuade domestic political constituencies that they are ‘standing up’ to American pressure. The best response by other countries to the change in US policy from the point of view of economic welfare at home, and obviously for welfare in the United States and the world as a whole, is to reduce their own protection. If they do this, they will offset—perhaps more than offset—the losses from the increase in US protection. Doing nothing is second best. At least the costs of Mr Trump will not be compounded by reduced gains from trade as a result of the partner country's own policy decisions.

The worst outcome for the partner countries, the United States and the world as a whole is retaliation through an increase in the partner's protection. This compounds the loss of gains from trade resulting from the American action—in the retaliating countries, and in the United States and the world as a whole as well. We drew on Irwin's history of US trade policy to note the lesson of US protectionism during the Great Depression: US leadership in ideas about policy could be as important as retaliation in other countries' protectionist policies (Irwin 2017).

The US trade deficit is certain to increase as a result of the two policy interventions combined. It will increase as a result of the higher budget deficit and real exchange rate, and will not be reduced by the increase in protection and associated dollar appreciation.

1.2 What Actually Happened

President Trump was true to his word on increasing protection, especially, but not only, against China. China chose to retaliate by increasing protection against the United States and some of its allies. And, as in the early 1930s, trade policy became more protectionist

in many other countries. The trade share of output fell sharply in the United States and fell in the world as a whole. This contributed to some deceleration of growth in productivity and output from the late 2010s in the United States and throughout the world.

The US domestic reality began to unfold as anticipated in our ‘Economic Consequences’ article. The budget deficit rose. Concerns grew about inflation and interest rates began to rise, increasing the nominal and real exchange rates. The trade deficit grew. The increase in employment decelerated with the approach to full employment. Total employment in manufacturing increased modestly, but less rapidly than from 2010 to 2016.

Then came the pandemic. The economy quickly fell into deep recession. Employment fell and unemployment rose sharply. The price level started to fall. The pandemic had global reach, so the exchange rate and trade deficit, which are determined by conditions relative to the rest of the world, did not shift by large amounts. The authorities responded by increasing public expenditure, reducing taxes and easing monetary policy at an unprecedented rate and to an unprecedented extent.

President Biden took office immediately after legislation of Trump's second anti-recessionary fiscal package, when there was still anxiety about recession and unemployment. The Biden government retained virtually all of the new Trump protection. Debt-funded fiscal expansion was extended with the American Rescue Plan presented to Congress in January 2021 and signed into law in March. The original presidential proposals provided for substantially higher revenues from increases in funding for the Internal Revenue Service and for a minimum level of taxation out of corporate accounting income, but these were pared back in the legislative process. The surviving Biden fiscal packages were massively expansionary. This was followed by the Infrastructure Investment and Jobs Act of November 2021, authorising expenditure of about US\$1 trillion over a decade. Then came the Chips and Science Act, designed to assist production of semi-conductors and large enough to have macro-economic implications.

By early 2022 the Biden macro-economic policy had been defined: unabated Trumpian protection and intensified Trumpian fiscal expansion.

The ironically labelled IRA of 2022 came next. This mainly provided tax rebates and subsidies related to production or use of zero-carbon goods and infrastructure. It was strongly protectionist, with many elements available only for sale or purchase of goods with high proportions of US content. There was provision for some revenue-raising measures, but how much of these would survive the legislative process was uncertain. Overall the package was expansionary. Since many elements were accessible to any resident who met specified criteria, without limit, it soon became apparent that the total budget impact would be much greater than the original estimate.

Recovery from the pandemic recession was swift. Economic growth in 2021 was the strongest since recovery from the early 1980s recession in 1984. Unemployment fell at the fastest rate on record, from 6.4 per cent in January 2021 to 3.9 per cent by December that year and pre-pandemic levels in early 2022.

Supply chains for many goods had been severely disrupted by pandemic restrictions, with COVID-19 lockdowns in China continuing dislocation through 2022. Diminished global supply capacity and policy-induced increases in demand led to sharp increases in inflation, exacerbated by the effects of the Russian invasion of Ukraine on global energy, chemical manufactures and food markets from February 2022. Inflation as measured by the Consumer Price Index reached a peak of 8.9 per cent in the year to June 2022 before decelerating to 6.9 per cent in December and to 3.7 per cent in the year to August 2023. The strong labour market saw wages rising more rapidly than inflation from March 2023 after a year of falling behind.

US monetary policy was tightened more rapidly than ever before. Cash rates were raised from near zero in March 2022 to 5–5.25 per cent in May 2023. Tight money and an easy budget lifted the exchange rate. The merchandise trade deficit, which had lifted

during the Trump presidency, reached a new high in 2021 and was bigger still in 2022.

Strong economic growth and low unemployment are usually associated with falling and low budget deficits. The continuing fiscal expansion through the Biden Presidency made this time different. At the depths of pandemic recession in 2020, the budget deficit was the highest ever outside the major wars as a share of the economy. It fell with recovery from recession to US\$1.38 trillion in 2022—5.4 per cent of GDP, then the highest as a share of the economy outside recessions and major wars. It is increasing again. It may exceed US\$2 trillion in 2023 after appropriate accounting for Congressional rejection of the University loan repeal. Nothing in sight suggests anything other than increasing deficits in the years ahead, even if the United States avoids a significant economic downturn.

Manufacturing employment is a bit higher than at the end of the Obama Presidency (an increase of 4.9 per cent over nearly 7 years). It has increased less than under the more open trade policies of the Obama Presidency (8.2 per cent over 7 years). Manufacturing's share in total employment has continued to fall. One surprise is that employment in the industries most favoured by the increased protection—steel and aluminium—actually fell.

1.3 The Green Trump: The Effects of Mr Biden's IRA

The Biden IRA is likely on balance to accelerate US domestic decarbonisation. The effects in the rest of the world are more difficult to judge. Outside the United States, four effects are likely to be important: influence on international discussion of policy; acceleration of innovation in production and use of zero-carbon goods and services; effects of changes in international trade on costs of inputs into zero-carbon production; and changes in global interest rates.

There are two clearly positive effects on decarbonisation in the rest of the world. First, the strong commitment to reductions of emissions in the United States and the

demonstration of progress have positive effects on the international political discussion of movement to net zero emissions. Second, the IRA contains incentives for innovation in zero-carbon goods and processes, which will reduce the costs of decarbonisation everywhere.

The third type of effect is constrained by the limited and declining US participation in international trade. The relative resource endowments of the United States suggest that, even with free trade, it would not be intensively involved in international trade in zero-emissions products. On capital goods, even when innovation is located in the United States, large-scale export is more likely from Europe and Northeast Asia. The Tesla car is an example—with early production in the United States followed by large-scale exports from China. On goods embodying renewable energy and other zero-carbon inputs, the absolutely large US domestic renewable energy and biomass resources accompany absolutely large domestic demand in an immense economy. The Trump–Biden policies make the United States a less significant player in global trade in zero-carbon products. In particular, the lift in the real exchange rate from bigger budget deficits and protection reduces competitiveness of US production in external markets, and protection reduces the import share of domestic purchases. The weaker participation of United States users and suppliers in global markets reduces gains from trade—that is, productivity—both in the United States and in the rest of the world. That means that US decarbonisation will not be directly a source of large gains from trade with complementary economies, or of terms of trade losses for countries with competing resource endowments and comparative advantage. The direct impact of the IRA will be mainly domestic.

The fourth effect comes not from the IRA alone, but from the suite of deficit-increasing policies of which the IRA is part. US budget policies are putting significant upward pressure on global interest rates. Higher interest rates systematically increase the costs of zero-carbon energy and goods, because their production is generally much more capital-intensive than traditional carbon-intensive goods. Through the

twenty-first century until late 2022, a tendency for higher global savings propensities and lower global investment propensities had been placing downward pressure on global real interest rates. Real interest rates on sovereign borrowing in countries considered to be safe for debt have been around zero in real terms over the past decade, with a downward tendency over the period. The high and rising US budget deficit has been a major factor in recent reversal of these tendencies. With the United States now representing over a quarter of conventionally measured global incomes and expenditure, the US budget deficit has been heading towards 2 per cent of global incomes and may go higher. Real 10-year interest rates on low-risk sovereign bonds have recently lifted to over 2 per cent. This is a drag on investment and economic growth in all industries everywhere. The drag is greater in the zero-carbon economy (which tends to be much more capital-intensive than the old fossil carbon economy), and especially in the developing world.

The US IRA measures have been emulated to some extent and in various ways by other developed countries, notably Canada, the EU, the United Kingdom, Japan and Korea, although these emulated measures have been less protectionist than the original. The emulations have tended to increase budget deficits and so have contributed to increased upward pressure on global real interest rates.

One other dimension of Trump–Biden policies is potentially of great importance for global decarbonisation: the attempt to reduce trade with countries that are ‘strategic rivals’ of the United States and to increase trade with ‘friendly’ countries (‘frenshoring’). There would be substantial consequences if these attempts were influential in the trade policies of strategic rivals or friendly countries. I examine these important effects in the 2023 APEC Lecture.

1.4 Should Australia Emulate or Participate in the IRA?

There are strong pressures to emulate the IRA from Australians wanting more action on reducing greenhouse gas emissions and on

increasing output in zero-carbon industries. There is pressure:

- to elevate the priority of reducing emissions;
- to use ‘carrots, not sticks’ in the form of subsidies that increase the budget deficit;
- to subsidise the products favoured by the IRA to avoid competitive disadvantage;
- to introduce protection for domestic production of some zero-carbon goods; and
- to favour participation in supply chains with politically friendly countries over others including through access to IRA fiscal subsidies to produce zero-carbon goods in Australia.

Standard international economics, of which Max Corden has been the great expositor, provides guidance to the answers. It suggests public provision of services when supply and demand conditions have the characteristics of public goods; and correction of market failure by making sure that firms pay for the costs that they impose on others, and are rewarded for the benefits that they confer on others. And it cautions us to be careful about the balance of taxes and expenditure—about the effects of corrective policies on the budget balance and public debt.

On the first of these pressures, the greater US efforts to decarbonise its economy increase confidence in all countries that they will be part of an effective international effort to reduce emissions. This support for global decarbonisation increases the economic benefits of Australia utilising its comparative advantage in zero-carbon goods. It also increases the economic and international political costs of Australia having weaker emissions reduction objectives than other developed countries, and failing to achieve its own objectives. The US elevation of the priority of climate change mitigation makes a case for elevation of priority in Australia.

Through what policies should that higher priority be reflected?

Standard economics urges caution on the second point of pressure for emulation of the IRA—using increases in the budget deficit, ‘carrots not sticks’, to encourage decarbonisation. Standard Corden analysis tells us that when a large country runs larger budget and trade deficits, other countries should run larger surpluses. Australia’s budget, trade and current accounts are currently in surplus. That reduces the cost of rising international interest rates driven by US policies. It strengthens our capacity to manage shocks from the international economy, which US budget policies have made more likely. We can spend something on carrots, while acknowledging the large advantages of maintaining reasonable budget discipline as we elevate the priority of climate change mitigation.

Standard international economics also urges caution on the third point of pressure for emulation of the IRA. One country (especially a large one) subsidising output of one product provides a reason for other countries to reduce support for that product. US subsidies for some goods or services weakens the case for subsidisation of those products in Australia.

The fourth point of pressure for emulation—protection of zero-emissions goods—might seem to be obvious, but warrants comment in the degraded contemporary state of public policy discussion. The costs of decarbonisation are much higher if a country seeks greater self-sufficiency in new products and processes. The costs are highest for small economies. Australia is small in this context. The United States is not. And the costs are much higher in countries with relative endowments of renewable energy relative to other economic resources that are very different from global averages. Here the costs of protection would be extremely high for Australia with its exceptionally rich endowments. Again, the costs of protection would be relatively low for the United States, with relative resource endowments close to global averages.

On the fifth point of pressure for emulation—the ‘frenshoring’ of supply chains—there are lessons from the theory of customs unions. If the United States is set on a protectionist path, exemption of friends from the trade restrictions unambiguously benefits the friends if the preferences are unrequited. But reciprocal preferences will not necessarily be better for the friends than unrestricted US protection. Mutual trade preferences are more likely to be damaging to the friend, the less important is trade with the United States in the absence of trade preferences. The United States would be a relatively unimportant trading partner with Australia in a zero-carbon world economy with open international trade.

There are some circumstances in which the economic losses of frenshoring need to be balanced against strategic benefits. These limited circumstances can be identified by rigorous analysis. The costs can be measured, and weighed against rigorously analysed strategic benefits. I discuss these matters in the 2023 APEC Lecture.

1.5 Australian Comparative Advantage in the Zero-Carbon World Economy.

Australia will generally do best on decarbonisation and development for itself and for the rest of the world if it specialises in production of goods in which it has comparative advantage. What are these goods in a zero-carbon world? They cannot be identified as an output of an economic model. To attempt to define comparative advantage econometrically is a conceit of discredited central planning.

Comparative advantage is best identified through observation of the operation of markets in which distortions have been corrected. The most important corrections in a zero-carbon world are internalising the external costs of carbon emissions, and the external benefits of innovation in the zero-carbon industries. It is also important to provide efficient supply of a range of public goods required in the new zero-carbon economy. However, governments must make choices about priorities in allocation of subsidies to encourage intervention, and to

provide public goods. They cannot avoid forming and acting upon judgements about likely future patterns of comparative advantage. Intelligent general analysis can identify probable patterns of comparative advantage. Australia has the economic endowments to be an immense exporter of zero-carbon products. It can be a renewable energy superpower of the zero-carbon world economy (Garnaut 2019). The densely populated, high-income countries with poor endowments of renewable energy in Europe and Northeast Asia are currently the largest potential markets. The United States is in a very different position from Australia, Europe and Northeast Asia.

Australia's solar and wind resources are at the centre of the country's strong comparative advantage in zero-carbon goods. A second source of Australian advantage is its opportunity for sustainably growing and harvesting biomass at low cost. A third is its legacy of infrastructure, skills and industrial culture from the old mining, forestry and agricultural industries. A fourth is that Australia is by far the world's main exporter of iron, aluminium and other minerals requiring zero emissions electricity and hydrogen for processing into metals in the zero-carbon world economy. The high international transport costs for electricity and hydrogen make the advantages of processing in Australia much stronger in the zero-carbon than in the old, fossil carbon economy. (Garnaut 2019, 2022).

In the opening chapter of *The Superpower Transformation*, I estimated that Australia could directly reduce global emissions by about 7 per cent by exporting zero emissions goods to countries that could not economically produce them from their own resources. Work is currently being undertaken within The Superpower Institute to refine that estimate.

Australia's specialisation in both exports and imports according to comparative advantage substantially improves the prospects of Northeast Asia and Europe decarbonising their own economies. It therefore substantially improves the prospects of the world meeting agreed net zero objectives. It sets up Australia with potential for a long period of full

employment with rising incomes for a growing population.

1.6 Policy for Australia as the Superpower

Twentieth century doyen of American economists Paul Samuelson was once asked to identify one idea in economics that was neither trivial, nor wrong. He nominated comparative advantage in international trade. Samuelson was right about the importance of comparative advantage. But a lifetime of familiarity with economic ideas made some important concepts trivial to him that are not so obvious to others. One is compensating for external costs and benefits if markets are to work in the public interest.

Corden's *Trade Policy and Economic Welfare* set out the principles with clarity and precision. One economic activity's provision of external benefits does not in itself make an economic case for protection. It does, however, make a case for taxing the external cost and for subsidising the external benefit. Without the tax or subsidy we will get too much of activities that impose costs on others, and too little of activities that confer benefits.

Two externalities are of special importance in building the zero emissions economy. A carbon price or an alternative is necessary for markets to work in the public interest in the presence of external damage from carbon emissions. The alternatives include bans on the use of carbon-intensive technologies, and subsidies on zero-emissions substitutes. And a subsidy or alternative is required to encourage pioneering innovation in the new industries, since the benefits are shared with competitors and others in society.

Australia has committed to reduce net emissions by 43 per cent from 2005 levels by 2030 and to zero by 2050. This is a minimal but nevertheless essential position. Achievement of the Commonwealth Government's goal of 82 per cent renewable energy supply by 2030 is essential to the 43 per cent by 2030 and net zero by 2050. To fail would damage the global decarbonisation effort and international acceptance of

Australia as a legitimate supplier of zero emissions goods to other countries.

Without a carbon price, using subsidies comprehensively to internalise external costs of carbon emissions, and external benefits of innovation, would impose costs on the public finances that severely damage economic development. A judicious balance of sticks and carrots is required to achieve Australian decarbonisation objectives.

1.7 Internalising the Carbon Externality for Power Generation

Making effective use of our rich solar and wind power resources is the key to achieving our immediate decarbonisation goals and to unlocking 'the Superpower opportunity'. The *Superpower Transformation* notes that the renewable energy dimension of the transition requires action to correct three main imperfections in renewable energy market exchange: the external costs from emitting greenhouse gas emissions; the public good nature of network services for power transmission and hydrogen transportation and storage; and provision of power reliability when no individual market participant has an incentive to provide the service that is warranted by the public cost of power system failure. The need for rewarding externalities from innovation in solar and wind power generation is not on the priority list: while particular initiatives warrant support, the main innovation radically to reduce costs in renewable power generation is behind us.

Here I focus on just one of these: the carbon externality. Chapter 1 of *The Superpower Transformation* discusses the other two (Garnaut 2022).

Australia would be in a strong position to achieve net zero emissions at low cost and to build the Superpower if we had retained the emissions trading system (ETS) that was operating from 1 July 2012 to 30 June 2014. We would correct the carbon externality. The ETS would provide the revenue for correcting other market failures with subsidies. Historically, the revenue that the ETS generated in the two years of its operation provided

the capital for the Australian Renewable Energy Agency and the Clean Energy Finance Corporation for many years. It also funded an increase in the tax-free threshold and increases in social security payments that fully compensated Australians on low and middle incomes for the increases in prices caused by the scheme. The Australian ETS was due to be integrated into the European Emissions Trading Scheme from 1 July 2014—the day after its abolition. That would have established indelibly Australia's credentials as a legitimate supplier of zero-carbon goods into the European market.

The abolition of the ETS by the Abbott Government was economic policy vandalism of incomparable cost. There is currently some discussion of Australia's low productivity growth over the past decade, and the need for reform to lift performance. The reversal of the decision to abolish the ETS is the most valuable economic reform available to Australian policymakers. Incomparably valuable, but excluded from consideration for the time being by our recent political history. In the meantime, Australia has a carbon-price-sized hole in the public finances of decarbonisation and building the Superpower.

With the first best policies denied for the time being, Corden's *Trade Policy and Economic Welfare* encourages us to search analytically for the second best.

Second best for the carbon externality in the electricity sector is the Renewable Energy Target (RET). The RET was introduced by the Howard Government in 2000, strengthened by the Rudd Government and weakened by the Abbott Government. The Emissions Trading Scheme was expected gradually to take over from the RET the burden of providing incentives for renewable energy expansion. The RET will remain in place until 2030 but was expected to be economically unimportant from the mid-2020s.

This RET has provided by far the most important policy support to Australian emissions reduction since the abolition of carbon pricing. The expectation of the RET's end in 2030 has removed this impetus to investment in grid-scale renewable energy. More recently, the

RET has provided a mechanism for certification of voluntary corporate action to reduce emissions. The RET's end in 2030 would remove the commercial rationale of bidding solar and wind power into the market at negative prices. Production would be curtailed when generators faced negative prices. Zero would become the lowest wholesale price, and average wholesale prices would rise sharply. The Appendix explains how negative prices encouraged by positive renewable energy certificate values under the RET reduce average wholesale power prices. Revenue from the RET reconciles low wholesale prices at times when the sun is shining and the wind blowing with continued production at negative prices and continued new investment. Absence of expectation of future RET revenue is an important reason why there has been little new commitment to investment this year. On the current trajectory, Australia will fall well short of 82 per cent renewable electricity supply by 2030.

In the absence of carbon pricing, the extension of the RET beyond 2030 and its strengthening is the best available mechanism for ensuring that Australia meets its 82 per cent renewable energy goal by 2030. It will do this without any increase in the budget deficit, and with substantially lower wholesale power costs now and into the future. Indeed, it is the only available mechanism for achieving 82 per cent renewable energy without large costs and risks. It is a second best solution to the biggest carbon externality problem in electricity supply.

1.8 Carbon Externalities in Other Industries and Externalities of Innovation.

While efficient supply of renewable energy is the foundation stone of the Superpower, it needs to be supported by incentives to avoid emissions and to reward new production processes in many potentially zero-carbon industries.

The government is making a heroic effort to compensate for external costs of carbon emissions outside renewable energy with the Safeguards Mechanism. This has the merit of

not requiring budget outlays. It does, however, have problems. Its baselines are inevitably arbitrary, inviting rent-seeking pressure. Credits can be drawn from sources that are subject to price caps that may be below the true economic cost of carbon. The fact that the caps are well below the European Emissions Trading Scheme price is likely to raise issues in exports to Europe from 2026. But the mechanism will substantially reduce emissions. The Safeguard Mechanism may be a long way from first best, but in combination with the extension and strengthening of the RET, it makes a crucial contribution to -43 per cent by 2030.

More complex issues arise with Superpower exports. Where the exports are to a country with a carbon price and a zero-carbon premium built into product prices, we can lean on the other country's carbon price in dealing with the carbon externality. Our products will need to be accepted as having low and then zero emissions in their supply chains. Official certification of zero-carbon status is required. The RET certificates will serve for renewable energy and products such as hydrogen in which renewable energy is the essential zero-emissions input. The government is working on certification for products other than renewable energy. European Union members and their neighbours in the United Kingdom and Scandinavia can be expected to police zero-carbon credentials fastidiously. Suppliers of emissions-intensive products to Europe, including Northeast Asian metal manufacturers, will have an eye on European standards in drawing imports from Australia.

How to bring to account the carbon externality in sales into countries—Australia, and others—that lack carbon prices? For sales in the Australian market, the costs imposed on carbon emissions by the Safeguard Mechanism are lower than the economic cost of carbon. There may be a case for a subsidy to cover part of the gap. What about export markets without a carbon price? Official and market pressures for decarbonisation provide some incentives. Is there a case for some subsidy to make up for the absence

of a carbon price? This needs to be the subject of analysis and discussion.

How to reward the benefits that innovative investors confer on others? The first movers in any new economic activity carry costs to generate knowledge that becomes freely available to all that follow. For this reason, business understands and business schools teach the advantages of being a follower and not a leader in use of new technologies. All Australian suppliers of debt and most of equity are cautious to the extent of aversion to new business models and technologies. There is a strong economic case for public fiscal support for investors in new ways of doing things. That was the justification for the establishment of ARENA (Garnaut 2008). Grant support from ARENA met a high proportion of capital expenditure in the first grid-scale solar projects. Those expenditures are now widely recognised as having contributed significant value to the Australian community.

Some of the required funding to support the early movers in each of the new Superpower industries and activities could be made available through established facilities: the National Reconstruction Fund; the North Australian Infrastructure Fund; ARENA and the CEFC with their wider mandates and increased funding; the Commonwealth's hydrogen facility; various state government programs to support innovation. More is required, within the constraints of sound budget management. The best mechanisms will establish general conditions to determine whether there is genuine innovation in new zero-carbon activities. Within well-designed mechanisms, investors will be able to rely on support once they have met specified conditions known in advance.

1.9 Max Corden's Lesson: Be Clear and Precise in Policy Analysis.

President Biden's IRA increases the chances of the world meeting agreed international objectives on timely achievement of net zero emissions, and so increases confidence in Australia's Superpower opportunity. It increases

pressure on Australia to meet its domestic decarbonisation targets. Australians are wise to emulate the commitment to achieving targets and increasing ambition. That is as far as emulation should go. Alternative paths to supporting movement to net zero-emissions and beyond that to building the Superpower are available. We can seek guidance from Max Corden's approach to trade policy and economic welfare and international macro-economic policy.

Clarity and precision in analysis suggests caution in following the United States into increases in debt-funded tax cuts and expenditure increases to support new zero-carbon projects and industries. There is a premium on measures like extension and strengthening of the RET and the Safeguard Mechanism that do not increase the budget deficit. There is a case for judicious support at a moderate cost to the budget where we can identify external benefits, and where supply conditions for services have the characteristics of public goods. Analytic clarity leads us to seek specialisation in both imports and exports according to comparative advantage—remaining open to the world's most cost-effective equipment and other inputs into the new industries, and seeking open access to all substantial markets. The most effective subsidy programs will establish general and transparent criteria. Established programs can provide some of the required funding. Clarity and precision in identifying recipients of support from the budget allows great progress with moderate expansion of public deficits.

Max Corden's clarity and precision in judicious application of the best of international economic analysis can help us to unlock the immense benefits for Australia and the world, from building Australia as the renewable energy Superpower of the zero-carbon world economy.

References

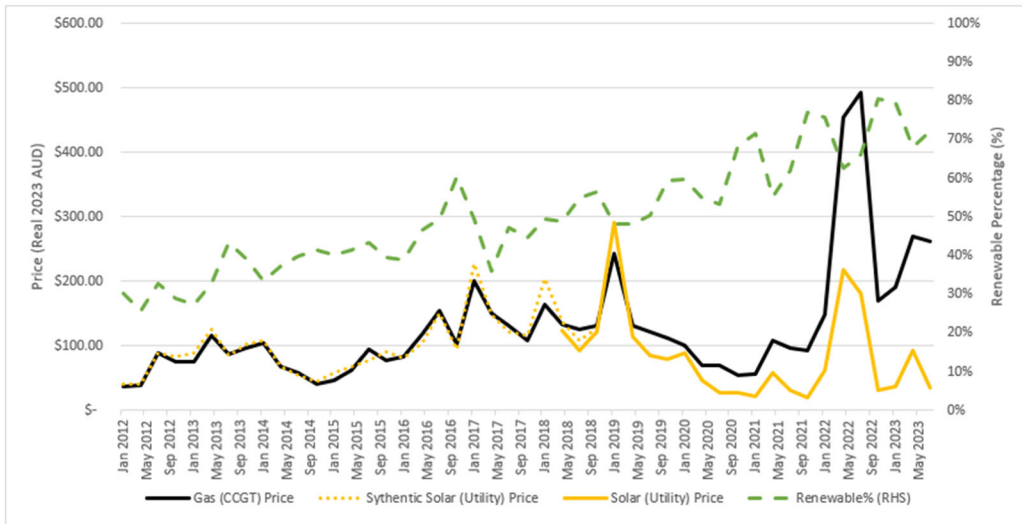
- Climate Change Authority. 2015. climatechangeauthority.gov.au
- Corden, M. 1974, *Trade Policy and Economic Welfare*, Oxford University Press, Oxford.
- Corden, M. 1977, *Inflation, Exchange Rates and the World Economy*, University of Chicago Press, Chicago.
- Corden, M. 2018, *Lucky Boy in the Lucky Country: the Autobiography of Max Corden, Economist*, Palgrave MacMillan, London.
- Corden, M. and Garnaut, R. 2018, 'The economic consequences of Mr Trump', *Australian Economic Review*, vol. 51, no. 3, pp. 411–417.
- Garnaut, R. 2008, *The Garnaut Climate Change Review*, Cambridge University Press, Melbourne.
- Garnaut, R. 2019, *Superpower: Australia's Low Carbon Opportunity*, BlackInc and Latrobe University Press, Melbourne.
- Garnaut, R. (ed.) 2022, *The Superpower Transformation: Building Australia's Zero-Carbon Economy*, BlackInc and Latrobe University Press, Melbourne.
- Irwin, D. A. 2017, *Clashing Over Commerce: A History of US Trade Policy*, University of Chicago Press, Chicago.

Appendix

How the Renewable Energy Target (RET) Lowers Wholesale Power Prices

Under the RET, retailers and large-scale users of power are required to surrender renewable energy certificates corresponding to their shares of the target. This adds to the costs of power generators using coal and gas. At times when renewable energy is determining prices—a substantial and increasing proportion of the hours each year—the cost is absorbed by the generator. At times when coal- or gas-based power are setting the wholesale prices, the price is added to the wholesale price. The increase in renewable energy supply that the RET induces leads to lower wholesale power prices. This lowers costs to users. The Australian Climate Change Authority undertook detailed analysis and concluded that the overall effect of the RET was to lower the cost of power to users (Climate Change Authority 2015). My assessment is that a carefully calibrated extension

Figure A1 The Reductions in Average Prices of Solar Power in South Australia as Renewable Energy Supply has Increased Over the Past Decade. Notes: The falling price of solar power (in 2023 prices) contrasts with the rising price of gas generation in the state over this period of rising gas prices. The increase in renewable energy supply has greatly moderated the effects on average wholesale power prices of large increase in wholesale prices for gas and coal power.



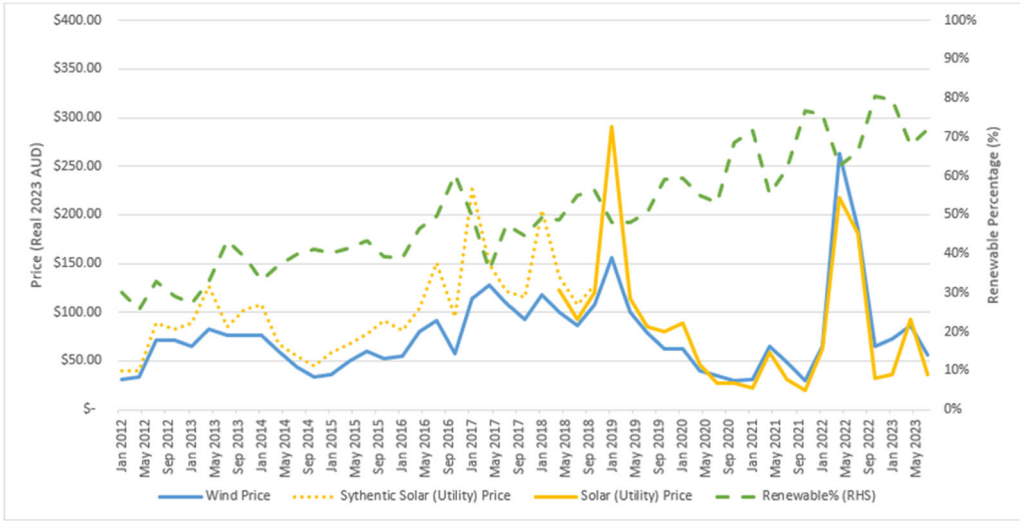
and strengthening of the RET from 20030 is likely to reduce costs to users.

Letting the RET die in 2030 as under current legislation would lead to large and immediate increases in average wholesale prices. The upward pressure would rise over time, compared with an alternative of extension and strengthening of the RET. Renewable energy is bid into the wholesale market at its marginal cost, less the value of the renewable energy certificate. The marginal cost is close to zero. With a renewable energy certificate valued at \$X, the solar or wind generator will continue to supply power into the grid until the wholesale power price falls to -\$X. In the absence of a positive value for the RET's renewable energy certificates, the solar or wind generator will spill power rather than sell it into the grid when the price falls below zero.

This Appendix illustrates the effect of the RET on average costs to power users with reference to recent South Australian (SA) experience. The Superpower Institute's Open NEM provides the data. Figures A1 and A2 demonstrate how the rising share of renewable

energy in SA has been associated with large reductions in the weighted average wholesale real price of wind and solar power delivered into the grid. This contrasts with the large rise in price of power generated from fossil fuels—in SA gas—delivered into the grid over this same period. SA is the state in which solar and wind power supplies by far the highest proportion of total generation—on average 71 per cent in 2022 and 79 per cent in the September quarter of 2023. SA wholesale prices were negative for 19 per cent of the time in 2022 and 31 per cent in the September quarter of 2023. The average negative value during these times was -\$58.6 per Mwh in 2022 and -\$59.1 in September 2023. The negative prices reduced average wholesale prices in SA by \$11.0 per Mwh in 2022 and \$18.3 in September 2023—compared with average wholesale prices if the price had been zero in all of the periods in which they had been negative. The mandatory requirement to surrender certificates under the RET added around \$8.4 per Mwh to costs of thermal power generators over the past year (average LGC price of about \$54).

Figure A2 The Downward Movements in Average Wholesale Wind Prices, Although Not So Strongly As For Solar Prices.



In the absence of the RET, solar and wind generators would spill power whenever the price fell to zero. Renewable energy supply would immediately fall, and average wholesale prices rise. Far from making progress towards 82 per cent renewables by 2030, there would be a sudden reduction in renewables supply to the grid. And there would be no incentive for additional investment in solar

energy and greatly reduced incentives for investment in wind. The resulting removal of negative prices would greatly reduce incentives and break strong current momentum for investment in grid-scale storage.

SA is the most advanced state in renewable energy supply. Its high renewables share reveals the direction in which other states will move in future.