The Superpower Institute

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Restoring Prosperity by Building the Superpower

Ross Garnaut AC, 14 February 2024

Check against delivery

When I spoke to the National Press Club in June 2008 and again in March 2011 about Australia doing its fair share in the global fight against climate change, my case was defensive. Short-term costs would avoid much larger long-term damage.

Rod and my message today is different. Australia's circumstances are different, and the effects of early action to reduce greenhouse gases are different.

Then, we were enjoying the second of two decades of prodigious growth in Australian living standards—the first from economic reform and the productivity boom of the 1990s, the second from the China resources boom. The 1990s when productivity growth was at the top of the developed world, and incomes growing strongly. Then this century to 2013 when living standards growth was at the top of the developed world. Now, we are at the end of a decade near the bottom on the measures that matter to ordinary Australians.

Angus Taylor was right on Insiders last Sunday to draw attention to the difficulties facing working Australians. Yes, these last 18 months have been bad, although it is a stretch to say that wage and price outcomes in the first year had much to do with a new government. Real wages fell by 2.3 percent from the June quarter of 2022 when the Government changed, to the September quarter of last year. The uptick in the September quarter is a relief, but it won't continue without a stronger economy. Real wages fell by a percent from the June Quarter of 2013 to the June quarter of 2022. That adds up to a decade in which real wages were lower at the end than at the beginning. That hadn't ever happened in Australia before.

Angus Taylor is right on one big point, but his history is wrong. Yes, we have to lift productivity. Yes, we have to put living standards of ordinary Australians back on an upward path. My book Reset: Restoring Australia After the Pandemic Recession, written deep in the pandemic in 2020, drew attention to how Australian per capita output growth fell from near the top of the developed countries for two decades, to near the bottom from 2013. The solution then in 2020 wasn't a return to what we were doing before the pandemic. The solution then and now is to face up to the reality, that major reform is needed if we are to restore rising living standards for ordinary Australians.

It won't be easy. There are headwinds. Real existing climate change is a headwind. We have to deal with more intense bushfires and flooding events. The rest of the world's dealing with climate change means that two of our three largest export industries will

phase down over the period ahead. These developments in themselves send productivity backwards, whether or not we understand the reality of climate change and the rest of the world's response to it. Putting Australia back on a path to rising productivity and living standards doesn't mean going back to the way things were a few years ago. It means looking at things differently, and doing things that we think impossible to restore Australian prosperity.

One big thing has changed for the better since we were talking together about climate change in the decade before last. Yes, there are the same defensive reasons for stopping human-induced climate change. But now it is clear as it wasn't clear then, that Australia's advantages in the emerging zero-carbon world economy are so large that they define the most credible path to restoration of growth in Australian living standards.

The change in our economic circumstances and the big change in economic opportunity in the zero-carbon economy mean that the best policy solutions change. In designing policies to secure our own decarbonisation, we now have to give a large place to Australia's opportunity to be the renewable energy Superpower of the zero-carbon world economy. The ETS recommended in 2008 and 2011 was best when the main concern was doing our fair share in the global effort at the lowest possible cost. The Carbon Solution Levy (CSL) that we propose today is better suited to take advantage of the immense benefits for Australian living standards from building the Superpower.

The global transition to net zero is Australia's opportunity. We can use it to raise productivity and living standards after the decade of stagnation. Other countries do not share our natural endowments of wind and solar energy resources, land to deploy them, as well as land to grow biomass sustainably as an alternative to petroleum and coal for chemical manufacture. In the zero-carbon economy, Australia is the economically natural location to produce a substantial proportion of the products currently made with large carbon emissions in Northeast Asia and Europe.

Our advantages are more than our land, sun and wind. As a developed country with sound public finances, we have a lower cost of capital than any developing countries except some Middle East oil exporters. This matters, as renewable energy and zero-carbon industrial production are much more capital-intensive than the industries and technologies they replace. The heritage of infrastructure, skills and industrial culture from mining, forestry and agriculture helps. Prudent concern for security of supply will see Europe looking to balance Middle East and African supplies with imports from Australia. In Northeast Asia, Australia has large locational advantages.

Our Superpower story is increasingly recognised in Northeast Asia and Europe. In an article in the AFR last month, Angela McDonald-Smith reported from the German Ministry of Education and Research:

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"Australia wants to be a renewable energy superpower. So, this is a perfect match because Germany is a superpower in the offtake of energy."

Or Michael Liebriech in Bloomberg NEF:

"The prohibitive cost of long-distance imports means that energy-intensive industries will inevitably migrate to regions with cheap clean energy. It is inconceivable for any country to import iron ore from Australia or Brazil, hydrogen from Australia, the Gulf, Canada or Africa, and make steel at a globally competitive cost".

These perspectives have been confirmed in conversations in recent months with major business leaders in Japan and China.

Last year, a team from the Oxford School of Engineering Science published in Nature Communications the results of an elaborate modelling exercise defining the cost of producing iron and steel in different locations in a zero-carbon world. Australia emerges as by far the world's largest producer of iron metal and steel, more than twice as large as any other country.

Making good use of our zero-carbon opportunity makes it possible for Northeast Asia and Europe—over two fifths of the world's emissions—to get to net zero. Reuben Finighan at The Superpower Institute is working through the detail. Here is a taste of what will come from this work.

China last year installed enough new renewable energy to supply twice the power from all sources used in Australia's National Electricity Market (NEM). To supply all of the renewable electricity China needs for zero net emissions now—converting all the coal, oil and gas where electricity can be used in its place—would take 100 times the capacity of the NEM today. That figure will continue to grow as China's economy grows. Its renewable resources are poorer than Australia's and concentrated in the north (much on the latitude of Hobart where winter days are short), and in the west (far from where industry is concentrated along the coast and in the south). Even if China were willing to pay twice Australia's expected costs in 2050, it would only satisfy half of its forecast requirement for wind and solar power from its own resources. That leaves a gap of over 6000 TWh. The cheapest way to source that immense amount of energy is by importing goods that embody renewable energy. Turning the iron ore China currently imports from Australia into metal before it is shipped would fill over a quarter of the gap. Making that iron metal in Australia would require 10 times the power now used in Australia's NEM.

The constraints on domestic supply of renewable energy are greater in the rest of Northeast Asia and in Europe. Japan needs an additional 1848 TWh of renewable energy to decarbonise existing power and industrial and other uses of fossil carbon. The equivalent in Korea is 1170 TWh, and in Germany 991 TWh.

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These numbers on electricity requirements do not include any contribution from products that require biomass as well as green hydrogen and electricity: sustainable aviation and shipping fuels, silicon, petrochemical feedstocks and nitrogenous fertilisers.

Our main message today is that export of zero-carbon goods can underpin a long period of high investment, rising productivity, full employment and rising incomes in Australia.

Which are the Superpower Industries?

Green hydrogen and ammonia will be important, and there are likely to be exports of renewable electricity through undersea cables. But exports of goods embodying these and other zero-carbon inputs are the main story.

The processing of minerals will be the most important, with iron a long way in front. Aluminium is big. Processing critical minerals are part of the Superpower story, including silicon, lithium, nickel, copper, cobalt and others.

The South Australian government's plans for the Upper Spencer Gulf lead the way, starting with green copper and green iron.

Australia has advantages in immense new industries requiring inputs of biomass as well as zero-carbon electricity and hydrogen.

Australia would use a tenth of global production of solar panels, wind turbines, batteries, electricity transmission cables and towers and hydrogen electrolysers and pipelines. For manufacturing inputs into these industries, unlike other manufacturing activities, we would suffer no disadvantage from having a small domestic market. We may have a comparative advantage in producing some inputs in which there are cost advantages in local metal or bio-carbon supplies and low-cost energy and capital, and which do not use labour intensively.

How are we going?

Our exceptional resources, legacy institutions from before 2013 (the Renewable Energy Target or RET, ARENA and the CEFC) and action by both Coalition and Labor state governments, kept the future alive through the Commonwealth's climate wars.

Remarkably after the period of Commonwealth policy disputation and incoherence, Australia has the world's largest solar and wind energy share in electricity. SA has twice the share of any substantial country. A sophisticated wholesale power market is making renewable power available at incomparably low cost for batteries or Superpower industries. Australia leads the world in use of battery power storage. Australia is showing the world how a power grid can operate securely and reliably mainly with solar and wind power. Hats off to AEMO and other regulatory agencies.

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In the entrails of the market data, we can see the renewable energy share of power generation expanding rapidly, and the average sales price of that power falling. If coal and gas power prices had remained at the levels of a decade ago, renewables expansion would have forced a large reduction in average power prices. But domestic gas prices exploded upwards in eastern Australia, at first with the commencement of exports from Gladstone, and then with the Russian invasion of Ukraine. Coal prices rose dramatically with the war in Ukraine.

In the NEM as a whole, the wind plus solar share rose from 4 percent in 2012 to 16 percent in 2019 and 31 percent in 2023. Both coal and gas generation contracted, with gas more rapidly from 12 percent in 2012 to 5 percent in 2023. The average price of wind power was $94 (2023 constant prices) in 2019 and fell back to $55 in 2023. Solar fell spectacularly from $90 in 2019 to $31 in 2023. Meanwhile the average price of gas power lifted from $63 in 2012 to $156 in 2019 and $172 in 2023.

SA is in some ways more interesting, because it leads the way to where Australia is headed. Variable renewable energy provided 75 percent of generation in 2023—similar to the 82 percent expected in the NEM as a whole in 2030 once account is taken of the hydro-electric contribution to national renewable power supply.

In SA, the wind and solar share rose from 29 percent in 2012 to 51 percent in 2019 and 75 percent in 2023. Gas contracted sharply after 2012 despite the closure of coal power generation, with solar and wind replacing all of the coal (20 percent in 2012) and half the gas. The average price of wind power fell from $86 in 2019 to $49 in 2023. Solar fell from $110 to $10 over these four years.

At low prices for renewable energy in SA, there are strong incentives for installing storage to shift availability from daytime when solar is abundant to evening when it is valuable. The cost of solar plus storage for evening use is far below the gas that it replaces. Expansion of battery and other storage will over time lift the low prices when solar output is high, and reduce them at other times—so long as participants in the market are confident that there will be no changes in market rules that reduce the value of arbitrage. The emergence of hydrogen and other industries that can ramp up power use when it is cheap will place a floor under the low prices without affecting the high.

Our international commitment to reduce emissions by 43 percent on 2005 levels by 2030 is the minimum required as a developed country to establish our credibility in the global climate effort. But we do neither the global climate effort nor our own prosperity any good if we meet our commitments in ways that block the emergence of the Superpower.

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The Five Pillars of National Economic Success

There are five pillars of national economic success today, as there were in the reform era that gave Australia its two world-beating decades of prosperity. These are also the five pillars of the Superpower.

The first pillar is open trade. That means Australian businesses are able to use without unnecessary restriction the best and lowest cost equipment and inputs to production in the world. It also means establishing open access to global markets for our zero-carbon exports. From 2026, the EU Carbon Border Adjustment Mechanism will allow Australian producers to realise a green premium for their products, so long as they can demonstrate a zero-carbon supply chain with genuine additionality, or that all relevant parts of the economy are subject to a carbon charge similar to that in the EU. Those principles will gradually spread to other importers of zero-carbon goods. We need to strengthen Australia's currently underdeveloped capacity to measure and account for carbon emissions. There are valid offsets to emissions, and we need to ensure that the offsets that we allow have integrity.

The second pillar is strong public finances. This is necessary for Australian producers to have access to a competitive cost of capital and a competitive real exchange rate. In our small open economy, it is necessary to insulate Australia against international shocks. The budgetary demands of things that only government can do in building the Superpower are large, so we should avoid expenditures on things that governments don't have to do.

The third pillar is a skilled labour force, and an informed and supportive community, that together are able to meet the requirements of rapid structural and technological change.

The fourth pillar is a favourable environment for business investment. Stable policy is important. Only sound policy can be stable. Let's get the policy right in the period ahead and keep it steady from there. Revenue-neutral replacement of conventional accounting profits by cash flow as the base for taxation of business income would increase incentives for investment and innovation. Allowing companies investing in and producing green energy and goods to opt in to cash flow taxation would accelerate investment and innovation.

The fifth pillar is establishing the right balance between the role of the state, and the role of competitive private markets. Only government can supply public goods, including the correction of imperfections in markets. Only government can secure efficient supply of natural monopoly infrastructure services. The things that only Government can do are so demanding that the rest should be left to competitive markets.

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The fifth pillar: the balance between the market and the state

The electricity wholesale market has had its ups and downs over the last several years. It has had to cope with sudden and large changes in Commonwealth and state policy, including opaque subsidies to keep coal power generators going when the market has called time on them. Currently, the market is delivering negative prices to consumers of energy in regions and at times where variable renewable energy is abundant, and high prices in the early evening when the fading sun doesn't contribute to meeting demand for electricity at the end of a hot day. The current wholesale market is underpinning a storage investment boom, and is helping to get Superpower industries started. There is talk in the electricity industry about a capacity mechanism. There is no evidence that a separate capacity market would deliver capacity as efficiently as the current wholesale market is doing. That many countries that are behind us in the energy transition have one is not evidence that we need one. Change has a cost. Change from something that is working well to something problematic has a double cost. Our strong message: don't change the one part of the NEM that is working well.

Markets only work for the community if government corrects any tendency for firms to impose costs on others without paying for them, or to confer benefits on others for which they are not rewarded. Failure to constrain the damage that carbon emissions does to others is a massive market failure. Without a carbon price, we made the correction for electricity in a second best way, through the RET. That worked surprisingly well. The Government is adding the CIS, which will operate with the RET until 2030 and then carry the whole load.

The expanded CIS signals that the Australian Government is determined to meet its decarbonisation and renewable energy targets.

There are two systemic risks of the CIS, associated with its claims on the budget, and its potential to drift into central planning of renewables investment. The budget risks are mainly in relation to wind and solar, not for underwriting investment in storage. The risks are lower up until 2030, when the green premium provided by the RET augments revenue from energy sales. The budget risks can be ameliorated in two ways. One is to make sure that mechanisms are in place to generate a green premium after the RET ceases in 2030, as a supplement to revenues from the sale of electricity. There will be no green premium without mandatory requirements to use green energy, or some charge on carbon emissions. The second is to make sure that early and rapid development of Superpower industries absorbs power when it is cheap and places a floor under prices.

The second systemic risk arises because governments are now likely to underwrite almost all renewable generation investments. Officials may be drawn into decisions on which projects should be built. In the context of a radically uncertain and rapidly changing energy transition, the most prescient public officials will get many calls wrong. Competitive private markets give better results even if only a small proportion of investors

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make the right calls, and the right calls are by chance. In a competitive market, the right calls shape the future. Firms guided by wrong calls shrink and become less influential. With central planning, the calls of the captain and their lieutenants shape the future, right or wrong. Officials intruding views on location, technology or timing of investments would place the CIS on a slippery slope to failure.

The Government is still thinking through the rules to be applied to the CIS auctions. We suggest that the Government consider a generally available CIS scheme, rather than one determined by auction. A formula would determine the levels of payments from and returned to the state. This would reduce the budgetary and avoid the central planning systemic risks. Details are in our note on recommendations.

Government also has to correct for the external benefits that pioneering firms confer on others when they invest in new industries and technologies. At a time of rapid change in zero-carbon energy and industry, there are large external benefits from innovation. The pioneers create knowledge from which business followers and the whole community benefit. ARENA has managed this correction for renewable electricity. We propose a Superpower Industries Innovation Scheme (SIIS), to support early investments in the new industries in a systematic manner. Details are also in the note on recommendations.

Government cannot avoid a major role in natural monopoly infrastructure: electricity transmission, and hydrogen transportation and storage. The economic regulation of transmission and distribution in Australia today is deeply problematic. Both need root and branch reform. Hydrogen is a clean slate. Developing sound principles for hydrogen infrastructure now can avoid repeating problems that have emerged in transmission. Some states are ahead of others. The Queensland Jobs Plan provides some capacity for new green industry while decarbonising the old. Incremental change has to proceed in all states, directed mainly at providing for decarbonisation of the established power system. While the incremental improvement is proceeding, we suggest that the Productivity Commission be asked to review electricity transmission and distribution, and hydrogen transport and storage to meet the requirements of the Superpower.

Finishing the Journey to the Superpower

I spoke to Stephen Chu, then President Obama's Secretary for Energy and a Nobel Laureate in Physics, immediately after the 2010 midterm elections had shown that the administration's favoured ETS would not pass the Congress. "How will you reach your targets without the ETS", I asked. "Don't worry Ross", Stephen responded. "We wanted to get there at low cost with an economically efficient mechanism. Now we will get there with less efficient, higher cost instruments. We will keep the costs as low as possible by having a common social cost of carbon guide our regulatory decisions." He went on to outline for me the many regulatory interventions that were unveiled over the next 6 years.

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The US journey had a large detour through the Trump years and for the time being has landed with the IRA. The first and second pillars, of open trade and strong public finances, would both be fractured by duplication of the US IRA in Australia. The IRA is turbocharging US decarbonisation. Good for the world. But its embodiment of the Trump-Biden support for eye watering fiscal deficits and protection is making the US uncompetitive in global markets.

We can probably get to the 82 percent objective and minus 43 percent target by finding second and third and fourth best ways of favouring zero-carbon power generation and industrial production. These are unlikely to get us to the Superpower. Viewed away from the climate wars and the extraordinary history of climate policy, Australia's circumstances call for an explicit payment by firms for the damage that their emissions impose on others.

We suggest consideration of a Carbon Solutions Levy (CSL). This is a levy equivalent to the European carbon price imposed on every tonne of carbon extracted from below the ground or imported into Australia.

This would introduce a green premium to secure access of our zero-carbon goods into international markets. The green premium would reduce the costs of the CIS. And the revenue generated by the CSL would greatly strengthen the budget for the SIIS, natural monopoly infrastructure and other things. The CSL could be integrated into markets for ACCUs and any RET certificates left over from earlier years—companies could purchase and surrender these as an alternative to paying the levy.

Sales to any country with arrangements that generate a comparable green premium from which Australian zero-carbon goods can benefit would receive a rebate for CSL payments on those sales. The rebate would apply now to members of the EU, the UK and other countries of Europe. It may apply to the US if the joint arrangement with the EU that is currently under discussions is executed. We hope that by 2030, our major trading partners in Northeast Asia would qualify for exemption.

We suggest its introduction in 2030-31, in time to provide the necessary green premium for securing access to green markets and meet the greater budgetary demands of the CIS at the end of the RET. We note simply for the discussion that there are advantages in starting earlier. If introduced over the next year, there is ample rationale for using part of the funding to reduce the costs of fuel to road users, and to reduce the cost of electricity—enough to reduce the consumer price index substantially. This would be a circuit breaker in Australia's cost of living crisis. Inflationary expectations would fall. This would provide an opportunity for Interest rate cuts to be brought forward in time. The risks of rising unemployment would fall.

Details of the CSL are set out in the note on recommendations.

We know that the constraints from the climate wars make the implementation of the CSL impossible. But not as impossible politically as accepting continued stagnation and decline in living standards. It is not as impossible as passing on to our children and grandchildren lower standards of living than our own parents and grandparents left to us. It is not as impossible as living with our failure to play our full part in the global effort to stop the bushfires and cyclones and denudation of our beaches getting worse. It is not as impossible as being unable to pay for our ageing population, and unable to pay for our submarines.

We expect that the established political parties will rule out this suggestion. That is the way ideas for efficiency-raising reform are discussed in contemporary Australia. That will not be the end of the matter. If there is continued community interest and growing support, political leaders will come back to it.

Conclusions

The Superpower Transformation can put us back on a path to higher productivity and living standards after a lost decade. The challenge is as great as any we have faced.

To build the Superpower, Australia will have to invest 5 percent of incomes or more for several decades. Obviously impossible. Impossible, until you recall that we did more than this for a decade to supply the minerals for Chinese industrial expansion between 2002 and 2012.

We will need continuity of policy over decades. Impossible. Impossible until you recall how the Australian community has enforced consensus from the major political parties for policies that deliver benefits widely in the public interest. Medicare is an example of this. Rising employment with rising incomes, especially in rural and provincial Australia, will enforce consensus.

There is no Superpower without community support in regional Australia for solar farms and wind turbines. Look at Barnaby Joyce and the angry 400 in Canberra last week, and community support is impossible. Impossible, until you open your ears to the different voices in rural and provincial Australia.

Half a percent or so of Australia's land mass will power the Superpower. That leaves a lot of room for local people to make choices about what to do with their land. Indigenous Australians own much of the best renewables country. We need not cover the best farm land. We need not cover the land of any people who don't want wind turbines and solar panels on their property.

Drive south from Armidale down the Hunter and wince at the gaping wounds in the earth and the mountains of black rock and dust on rich farm land that nurtured Australia's best merinos, literary art, wine and thoroughbred horses. We can respect Barnaby's friendship

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with the gas and coal oligarchs, and still wonder at the selective anger at disturbance of this beautiful country.

I have spent a lot of time in the central west of Queensland since seven mayors from the west asked me to help them think through how they could use their sun and wind for permanent jobs. The heartland of the old Australian bush. Where Clancy of the Overflow went droving; the shearers and the teamsters met beneath the Tree of Knowledge and decided to use their new democracy to make a better country; Banjo wrote Waltzing Matilda; and the Queensland and Northern Territory Aerial Services built the planes and what is now the world's oldest international airline. Big country with big skies. Where the whole New England electorate could wander lost in the back paddock of an average sheep or cattle station. Where people want jobs so that their children and grandchildren don't all end up in the big smoke in Rockhampton and Brisbane as they have done for two generations. They want renewable power generation if they get sustainable income and local industry from it. They welcome the Queensland Government's and Energy Queensland's support for a local renewable energy industrial precinct.

Now, 11:30 am Brisbane time and 12:30 in Canberra, Premier Steven Miles is preparing to introduce a bill for a law for 75 percent reductions on 2005 emissions by 2035. That's great for long-term jobs in the Queensland bush.