MINERALS COUNCIL OF AUSTRALIA

SUBMISSION
TO THE CLIMATE CHANGE AUTHORITY'S
SPECIAL REVIEW

MARCH 2015

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Australia has made a strong and fair contribution to the global response to climate change

For the last 25 years, Australia has outperformed many developed and major developing nations in constraining the growth of $CO_{2\text{-}e}$ emissions.

Under the Kyoto Protocol commitments, between 1990 and the average of 2008-2012, Australia's $CO_{2\text{-}e}$ emissions grew by just 3.6 per cent. In contrast, $CO_{2\text{-}e}$ emissions in the United States grew by 9.3 per cent. Canadian emissions grew by 41.2 per cent, New Zealand's emissions grew by 70 per cent and Japan's grew by 5 per cent.[1] The significant fall in the European Union's emissions can be mainly attributed to collapse of industry in East Germany following the collapse of the Berlin Wall. The same phenomenon was observed in former Eastern European states. Nevertheless, emissions in many developed European nations grew strongly over the two decades. For example, Spain's emissions grew by 26 per cent, Greece's by 16 per cent and Ireland's by 11.6 per cent.[2]

In the developing world, emissions grew exponentially as nations put economic development and the alleviation of poverty as the priority. China's $CO_{2\text{-}e}$ emissions grew by 339 per cent between 1990 and 2010, while India's doubled.[3]

Australia's carbon productivity ($CO_{2\text{-}e}$ emissions per dollar of gross domestic product) also improved faster than most economies. In particular, Australia's emissions per $ of GDP have improved by 50 per cent since 1990. This compares with a 40 per cent improvement in both the EU and the US. Canada's carbon productivity improved by 15 per cent over this period while Japan's improved by 11 per cent.[4]

Australia's 2020 target is a fair contribution to global emission reductions

A number of authoritative studies have underlined the fact that the economic burden being borne by Australia in meeting its 2020 target is comparable to or *greater* than many of its developed country counterparts who have nominally more ambitious targets.

First, analysis by the Australian Treasury of the comparative costs of various nations' 2020 emissions reduction targets found that while Australia's headline emissions reduction target was *lower* than selected nations (the European Union, Japan), the economic cost of reaching that target was *higher*. The analysis showed that Australia's minus 5 per cent target would result in a loss of GNP three times than that experienced by the EU in pursuing a minus 20 per cent target.[5]

Second, research by a team headed by prominent Australian economist Warwick McKibbin reached a similar conclusion. Professor McKibbin found that Australia's 2020 target (a 5 per cent reduction on 2000 levels), imposed higher economic costs on Australia than most of its counterparts nations in the developed world. It found that Australia's target would result in a 6.3 per cent reduction of GDP from business as usual levels (greater than the reduction for Japan, 5.1 per cent; the US, 2.7 per cent; or the European Union 4.9 per cent).[6]

Third, analysis undertaken in late 2014 by former senior economic adviser to US President Bill Clinton, Jeffrey Frankel and Valentina Bosetti has sought to define comparative fairness using three metrics. These include that i) rich nations should be prepared to accept bigger cuts than developing

[1] National Inventory Reports to the UNFCCC. http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/7383.php . Australia and EU use average across 2008-2012; others use 2008-2011. Final report under the first commitment period due later in 2015. All figures except EU include land use, land use change, and forestry (LULUFC).
[2] National Inventory Reports to the UNFCCC using base year and average of 2008-2011.
[3] A. J. Leggett, China's Greenhouse Gas Emissions and Mitigation Policies, Congressional Research Service, July 18, 2011, p. 9; For India http://edgar.jrc.ec.europa.eu/overview.php?v=GHGts1990-2012 .
[4] N. Brown, M. Adams, R. Wickes, *Climate Policy and Australia's Resources Trade*, Report for the Minerals Council of Australia, 2015.
[5] Australian Government, *Economic cost as an indicator for comparable effort*, Submission to the AWP-KP and AWG-LCA, May 2009.
[6] W McKibbin, A Morris, P J Wilcoxen, Comparing climate efforts: a model based Analysis of the Copenhagen Accord, The Harvard Project on Climate Agreements, June 2010 at http://belfercenter.ksg.harvard.edu/files/McKibbin-DP-June2010-final.pdf

nations, ii) that it is not reasonable to expect nations to agree to cuts that would impose disproportionately higher costs on them and iii) that countries with sharply rising emissions be expected to reduce them, but not practical for them to reverse them fully or instantly.[7] Frankel and Bosetti applied these tests to the 2020 emissions targets adopted by 30 developing and developed nations. The analysis found that Australia's 2020 emissions reduction target is comparable in 'economic fairness' to key developed nations, including the European Union and the United States, and is more ambitious than many others including those of Canada, Japan and Singapore.[8]

Australia's economic structure is distinctive amongst developed nations

Australia's high per capita emissions does not indicate an inadequate approach to emission reductions; indeed to use such an approach is problematic for two reasons. First, the resource and emissions intensity of our economy and trade, our relatively fast trend rate of economic growth and our fast population growth make Australia very distinctive among advanced economies. Minerals and energy exports, for example, account for nearly 60 per cent of Australia's merchandise exports, compared with the OECD average of around 11 per cent. This distinctiveness needs to be taken fully into consideration by Australia's policy makers in considering the review of Australia's emissions targets. Second, the per capita approach assumes that the world's population is divided into roughly 200 units of identical geography and topography, resource endowment, stage of development, population growth, age composition, life expectancy, economic growth levels and prospects, access to technology, political structure and environmental amenity.

A focus on per capita emissions also ignores the complementarity that underpins global commerce. It fails to take account of the fact that many nations generate emissions in the production of goods and services consumed by others. It ignores the fact that if nations decide to end the production and export of certain products (in order to reduce emissions) then the economic consequences for both nations would be significant. Nearly one quarter of Australia's emissions are generated in agricultural and minerals production the majority of which are exported to meet the demands of others.

It is also critical to remember that a key determinant of a nation's emissions footprint is population growth. Targets must take account of the great differences in projected population growth over the period to 2030. According to United Nations projections, Australia's population will *grow* by 16 per cent (3.8 million people) between 2015 and 2030. Over the same period, Germany's population will *fall* by 4.7 per cent (3.9 million), Japan's by 6.7 per cent (8.4 million), Russia's by 6.5 per cent (9.3 million) and Italy's by 2.7 per cent (1.7 million).

Australia's 2030 target must be based on comparable effort, not identical targets

When setting its 2030 target, Australia must not simply adopt an interim target adopted by other nations (or groups of nations). Identical targets do not mean comparable sacrifice. Sharp reductions in emissions will be difficult to achieve given that Australia's economic and population growth will far exceed many of our developed country partners over the next 15 years.

Australia's contribution to mitigation efforts must be fair: the economic costs of abatement borne by Australia should be no higher than the costs borne by other advanced countries and our competitors in global markets. In a practical sense that means participlating in international efforts that are responsive to countries' unique circumstances – their different economic and trade structures, geographies, demography, growth prospects and so on.

The principle that the economic costs of abatement should be broadly similar across advanced countries and that all nations should look to contribute has guided Australia's approach to negotiations on climate change since the mid-1990s. It is important that this approach continue to frame Australia's approach.

[7] V Bosetti and J Frankel, A Pre-Lima Scorecard for Evaluating which Countries are doing their Fair Share in Pledged Carbon Cuts, Viewpoints, The Harvard Project on Climate Agreements, November 2014, http://belfercenter.ksg.harvard.edu/files/frankel_vp-nov2014_v2.pdf

[8] V Bosetti and J Frankel, A Pre-Lima Scorecard for Evaluating which Countries are doing their Fair Share in Pledged Carbon Cuts, Viewpoints, The Harvard Project on Climate Agreements, November 2014, http://belfercenter.ksg.harvard.edu/files/frankel_vp-nov2014_v2.pdf

The Climate Change Authority proposal for a 40-60 per cent reduction in emissions by 2030 takes no account of economic impact

The decision on an emissions reduction target by 2030 will have a potentially profound impact on the Australian economy. In its deliberations to date, however, the CCA has failed to assess the national economic impact of competing emissions reductions targets.

In its *Review of the Caps and Targets* in 2014, the CCA recommended that Australia consider emission reductions of between 40 and 60 per cent off 2000 levels by 2030. Such a reduction, of at least 234 Mt, is equivalent to the combined total of all electricity and agriculture emissions today.

This recommendation did not give due weight to the domestic economic costs, specifically across sectors and regions, of Australia's *existing* abatement targets when it urged still deeper immediate cuts. The CCA gave no weight to the domestic economic impacts of increasing the reduction targets past 2020. In doing so, the CCA has conspicuously failed to consider Australia's comparative advantage in agricultural and resources production and export. In doing so, it has also failed to consider the fact that many nations, not just in East Asia, rely on Australia for the steady and uninterrupted supply of coal, gas and uranium for energy production, livestock exports for protein and coking coal, metals and ores for infrastructure development. In effect, Australia provides these nations with the resources that they cannot provide themselves. As a result of these trade flows, Australia's emissions levels are higher, including in per capita terms. For example, the $CO_{2\text{-}e}$ emitted in the breeding, production and processing of packaged beef is counted against Australia, not the 57 countries that import it. Similarly the emissions generated in the extraction and processing of copper exports are counted against Australia not the 12 countries that import them.

These realities cannot be simply waved away in the national debate over Australia's emissions reduction targets. Failure to take account of the realities of Australia's economic structure – and the contribution Australia makes to regional economies as a major commodity exporter – will result in the choice of a target that will damage the Australian economy and the living standards of average Australians.

Australia's 2030 emissions reduction target must be based on comprehensive economic analysis

The development of Australia's 2030 emissions reduction target must be informed by comprehensive analysis (including economic modelling) that measures the economic impact on all major national industry sectors and states and territories. To adopt an emissions reduction target without such analysis would be reckless and a grave oversight.

Australia's approach should resemble that which informed the setting of Australia's emissions target in the lead up to the third Council of Parties (COP3) talks in Kyoto in 1997. Australia's approach to that negotiation was backed by detailed, real time and dynamic analytical tools that were utilised to examine the cost and economic impacts on individual (and sub-sectors) of achieving possible emissions targets by sector (and some key subsectors) including measures of impacts on output, employment, input costs and flow on effects to the overall economy. The comprehensive and real time nature of the modelling provided the then Australian Government with an up to date assessment of the implications of different emissions targets. Australia's contribution to the collective effort required should be economically comparable.

March 2015

INTRODUCTION

The Minerals Council of Australia welcomes this opportunity to contribute to the Climate Change Authority's Special Review of Australia's emissions reduction targets.

The MCA is the peak industry body representing small, medium and large firms engaged in the exploration, extraction and processing of minerals and energy resources in Australia. MCA member companies account for more than 85 per cent of Australia's annual minerals industry production and a higher share of minerals exports. They range from the largest mining companies in the world operating across multiple commodity groups in many jurisdictions to junior explorers with a single project.

Setting Australia's emission reduction targets for the next decade will have profound implications for the Australian economy and the living standards of Australians. The emissions-intensive, export-oriented minerals sector is a major and essential contributor to national income, investment, high-wage jobs, exports, and government revenue in Australia and therefore seeks to play a constructive role in these discussions.

Australia will make continue to make an important contribution to global co-operation on climate change. As a developed country it makes important contributions to the development of new technologies which are essential for reducing global emissions and financial contributions to United Nation's funds designed to assist other nations in their efforts. Setting appropriate targets will be a collective global effort to deliver the reductions to meet climate goals.

The mining sector supports global co-operation. Sustained global action is required to reduce the scale of human induced climate change. A measured transition to a low emissions global economy will require a global agreement for greenhouse gas emission abatement that includes emissions reduction commitments from all major emitting nations; market based measures to promote lowest cost abatement and, importantly, substantial investment in a broad range of low emissions technologies and adaptation measures.

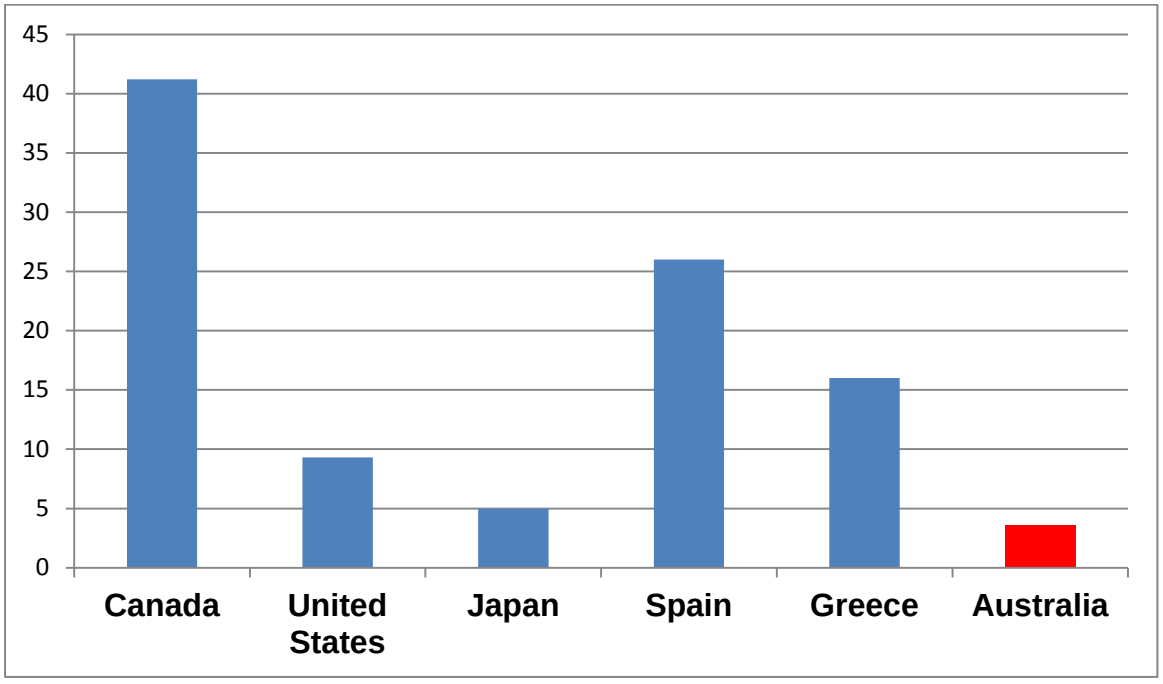
1. AUSTRALIA HAS MADE A STRONG AND FAIR CONTRIBUTION TO THE GLOBAL RESPONSE TO TACKLING CLIMATE CHANGE.

For the last 25 years, Australia has outperformed most developed and developing nations in constraining the growth of $CO_{2\text{-}e}$ emissions.

Under the Kyoto Protocol commitments, between 1990 and the average of 2008-2012, Australia's $CO_{2\text{-}e}$ emissions grew by just 3.6 per cent. In contrast, $CO_{2\text{-}e}$ emissions in the United States grew by 9.3 per cent. Canadian emissions grew by 41.2 per cent, New Zealand's emissions grew by 70 per cent and Japan's grew by 5 per cent.[9] The significant fall in the European Union's emissions can be mainly attributed to collapse of industry in East Germany following the collapse of the Berlin Wall. The same phenomenon was observed in former Eastern European states. Nevertheless, emissions in many developed European nations grew strongly over the two decades. For example, Spain's emissions grew by 26 per cent, Greece's by 16 per cent and Ireland's by 11.6 per cent.[10]

In the developing world, emissions grew exponentially as nations put economic development and the alleviation of poverty as the priority. China's $CO_{2\text{-}e}$ emissions grew by 339 per cent between 1990 and 2010, while India's doubled.[11]

Graph 1: Net emissions performance 1990 to 2008-12



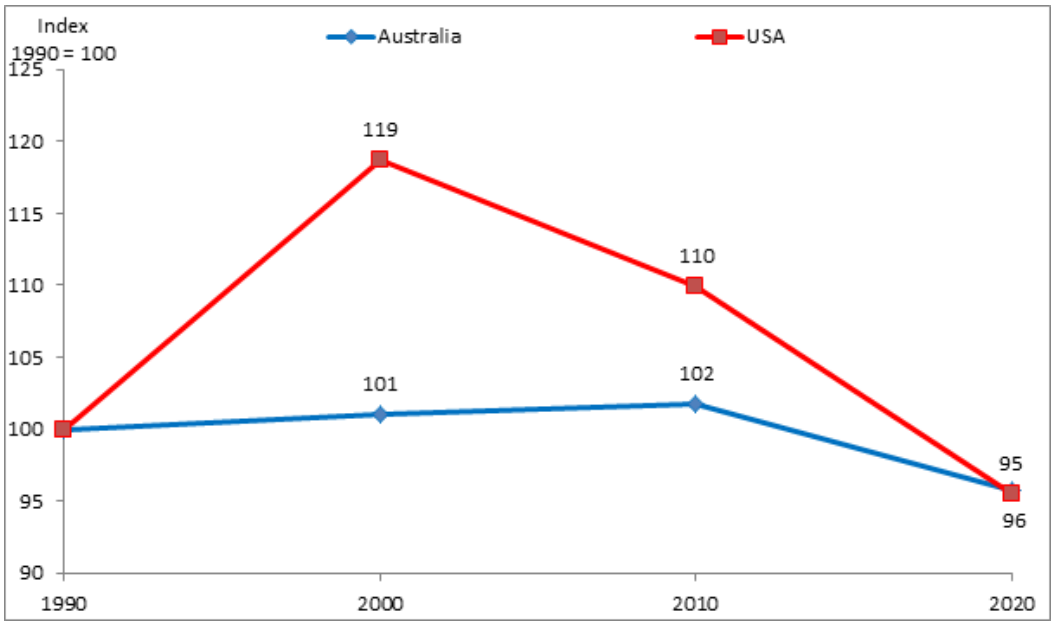
Sources: Climate Analysis Indicator Tools (CAIT), World Resource Institute, European Commission, BR CTF Submissions to UNFCCC

There have been recent claims that Australia has been out-performed by the United States in its emissions reduction efforts. This is not correct when a common base year of 1990 is deployed. Between 1990 and 2005, $CO_{2\text{-}e}$ emissions in the United States grew by over 18 per cent before tracking down to 10 per cent in 2010.[12]

[9] National Inventory Reports to the UNFCCC. http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/7383.php . Australia and EU use average across 2008-2012; others use 2008-2011. Final report under the first commitment period due later in 2015. All figures except EU include land use, land use change, and forestry (LULUFC).
[10] National Inventory Reports to the UNFCCC using base year and average of 2008-2011.
[11] A. J. Leggett, China's Greenhouse Gas Emissions and Mitigation Policies, Congressional Research Service, July 18, 2011, p. 9; For India http://edgar.jrc.ec.europa.eu/overview.php?v=GHGts1990-2012 .
[12] United States submission to UNFCCC, Biennial Reporting – Common Tabular Format (BR CTF), 2014

The bottom line is that Australia has performed *better* than the US in dealing with emissions since 1990, and will outperform the US in the period to 2020.

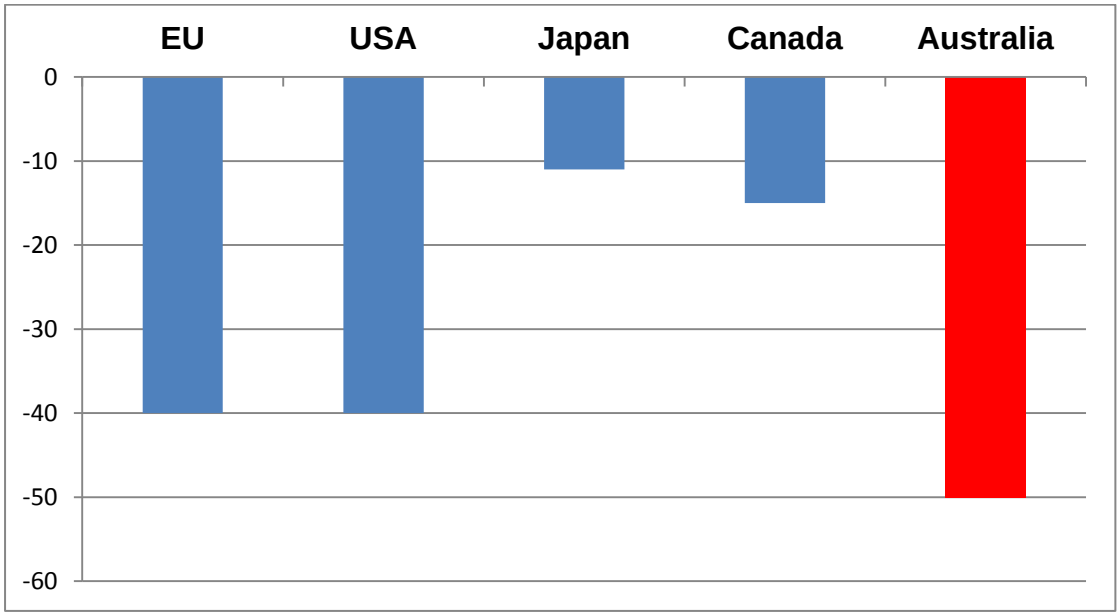
Graph 2: Comparative Emissions Trends and Projections 1990 to 2020: USA and Australia



Department of Environment. US submission to UNFCCC (BTR1, 2014).

Australia's 'carbon productivity' ($CO_{2\text{-}e}$ emissions per dollar of gross domestic product) also improved faster than most economies. In particular, Australia's emissions per $ of GDP have improved by 50 per cent since 1990. This is projected to fall to as much as 70 per cent by 2020.[13] This compares with a 40 per cent improvement in both the EU and the US. Canada's carbon productivity improved by 15 per cent over this period while Japan's increased by 11 per cent.[14]

Graph 3: Carbon Productivity: Reduction in $CO_{2\text{-}e}$ per dollar of GDP between 1990 and 2008-12

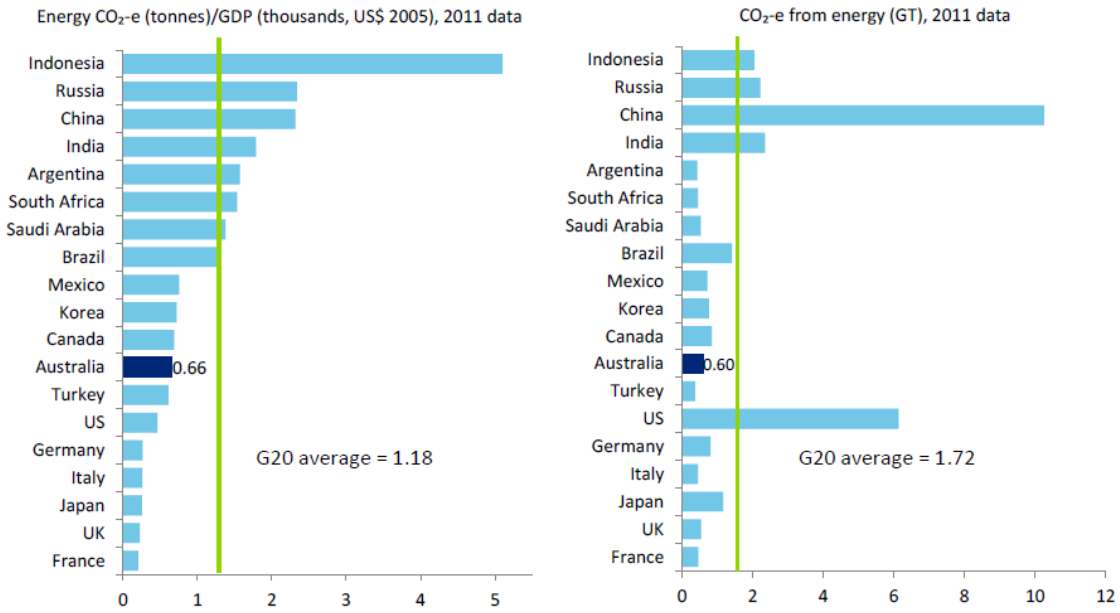


Source: Brown, Adams and Wickes 2015

[13] Deloitte Access Economics, *Long term economic and demographic projections*, November 2011.
[14] N. Brown, M. Adams, R. Wickes, *Climate Policy and Australia's Resources Trade*, Report for the Minerals Council of Australia, 2015.

The emissions intensity of Australia's economy ranks favourably with most other major economies.

Graph 4: Emissions intensity performance: G20 nations



Source: World Resources Institute data, IEA data, Deloitte analysis

Note: Includes emissions from land use and land use change and forestry

2. AUSTRALIA'S 2020 TARGET IS A FAIR CONTRIBUTION TO GLOBAL EMISSION REDUCTIONS.

The economic burden being borne by Australia in meeting its 2020 targets is greater than many of its developed country counterparts.

This has been reinforced by three authoritative economic analyses.

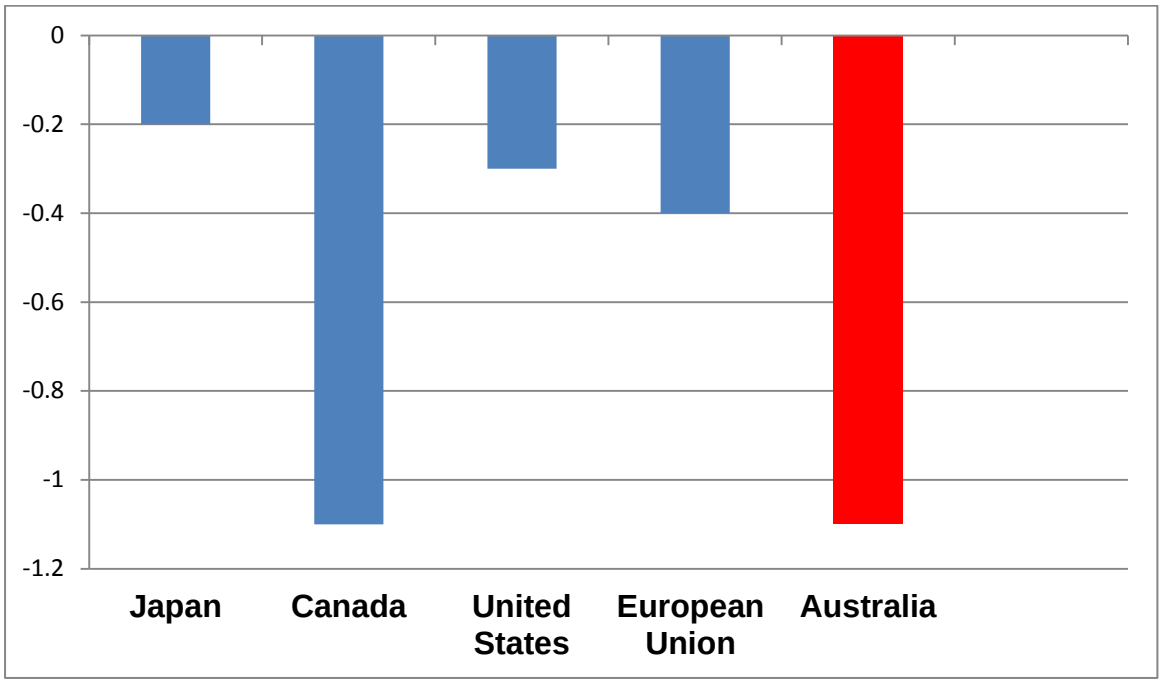
First, in 2009, the Australian Treasury analysed the comparative costs of various nations' 2020 emissions reduction targets. While Australia's headline emissions reduction target was *lower* than other nations, the economic cost of those targets was *higher* than for most developed nations.

The Australian Treasury analysis concluded that:

> The analysis shows that Australia faces high economic costs, relative to most other developed countries, due to its large share of emission- and energy-intensive industries and a dominance of low-cost coal in electricity generation.[15]

The analysis showed that Australia's minus 5 per cent target would result in a loss of GNP three times than that experienced by the EU in pursuing a minus 20 per cent target. These findings reflect the fact that the costs of abatement in the Australia economy are high.[16]

Graph 5: The economic impact of emissions reductions targets to 2020



Source: Australian Treasury. 2009.

Second, economic modelling by prominent economist Warwick McKibbin in 2010 found that Australia's 2020 target (a 5 per cent reduction on 2000 levels), imposed higher economic costs on Australia than most of its counterparts nations in the developed world. The McKibbin analysis found that Australia's target would result in a 6.3 per cent reduction of GDP from business as usual levels

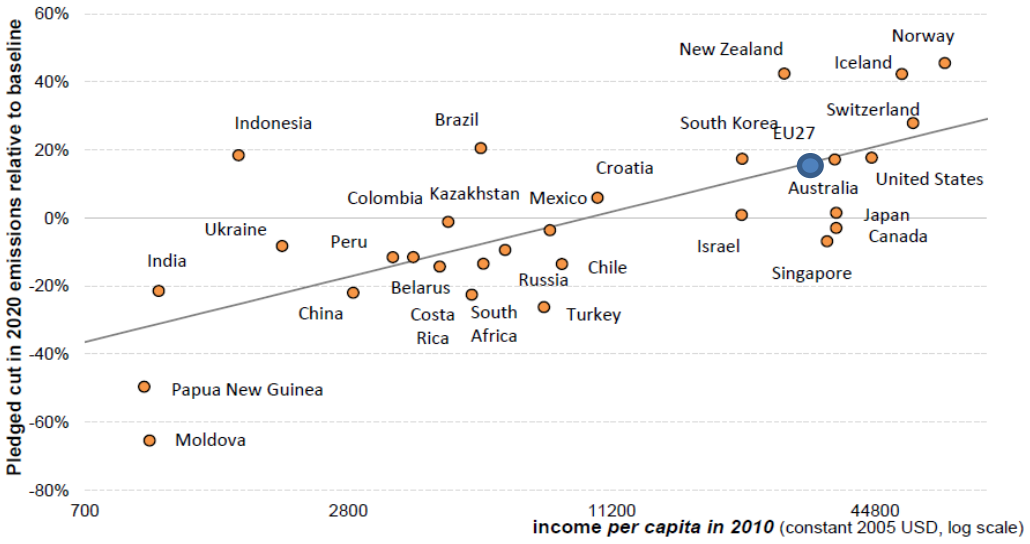
[15] Australian Government, *Economic cost as an indicator for comparable effort*, Submission to the AWP-KP and AWG-LCA, May 2009.
[16] This has been recognised by Australia since the beginning of the Kyoto Protocol, See the Hon. Senator R. Hill, *Statement to the Fourth Conference of Parties to the UNFCCC,* Buenos Aires, 1998.

(greater than the reduction for Japan, 5.1 per cent; the US 2.7 per cent; or the European Union 4.9 per cent).[17]

Third, analysis undertaken in late 2014 by former senior economic adviser to US President Bill Clinton, Jeffrey Frankel and Valentina Bosetti have sought to define 'comparative fairness' of national emissions targets using three metrics. These include that i) rich nations should be prepared to accept bigger cuts than developing nations, ii) that it is not reasonable to expect nations to agree to cuts that would impose disproportionately higher costs on them and iii) that countries with sharply rising emissions be expected to reduce them, but not practical for them to reverse them fully or instantly.[18] Frankel and Bosetti applied these tests to the 2020 emissions targets adopted by 30 developing and developed nations.

The analysis found that Australia's 2020 emissions reduction target is comparable in 'economic fairness' to key developed nations, including the European Union and the United States, and is more ambitious than many others including those of Canada, Japan and Singapore.[19]

Graph 6: The 'comparative fairness' of 2020 emissions reduction targets.



Notes: * Baseline = simple average of the country's actual emissions in 2005 and the level expected for 2020 in the absence of international action. Estimation formula is % cut = -1.29+ 0.14*ln(GDP pc) + e.

Source: Bosetti and Frankel, Harvard Project on Climate Agreements, Belfer Center for Science and International Affairs.

Australia's economy is distinctive amongst developed nations

The resource and emissions intensity of our economy and trade, our relatively fast trend rate of economic growth and our fast population growth make Australia very distinctive among advanced economies. Minerals and energy exports, for example, account for nearly 60 per cent of Australia's merchandise exports, compared with the OECD average of around 11 per cent. This distinctiveness needs to be taken fully into consideration by Australia's policy makers in considering the review of Australia's emissions targets.

Australia's minerals industry operates in a global context where investment opportunities exist in other resource-rich countries and where capital, skilled labour and technology are highly mobile. In taking on new domestic and international emissions commitments, it is critical that new layers of cost added

[17] W McKibbin, A Morris, P J Wilcoxen, Comparing climate efforts: a model based Analysis of the Copenhagen Accord, The Harvard Project on Climate Agreements, June 2010 at http://belfercenter.ksg.harvard.edu/files/McKibbin-DP-June2010-final.pdf
[18] V Bosetti and J Frankel, A Pre-Lima Scorecard for Evaluating which Countries are doing their Fair Share in Pledged Carbon Cuts, Viewpoints, The Harvard Project on Climate Agreements, November 2014, http://belfercenter.ksg.harvard.edu/files/frankel_vp-nov2014_v2.pdf
[19] V Bosetti and J Frankel, A Pre-Lima Scorecard for Evaluating which Countries are doing their Fair Share in Pledged Carbon Cuts, Viewpoints, The Harvard Project on Climate Agreements, November 2014, http://belfercenter.ksg.harvard.edu/files/frankel_vp-nov2014_v2.pdf

to the economy through additional abatement commitments are roughly in line with the costs borne by comparable countries, including our major trading partners. Not to do this would damage major trade exposed, emissions-intensive industries like minerals and energy that account for the great bulk of Australia's total exports, and would have negative implications for the wider economy as well as for government revenue.

It is also fundamental to note that Australia competes mostly (though not exclusively) with developing nations, who will be under less pressure to commit to ambitious targets.

For example, in global coal markets, Australia competes with Indonesia, South Africa, the United States and Russia, with new competitors emerging in South America and Africa,

In aluminium, Australia competes with China, Russia, Canada and, increasingly, the Middle East.

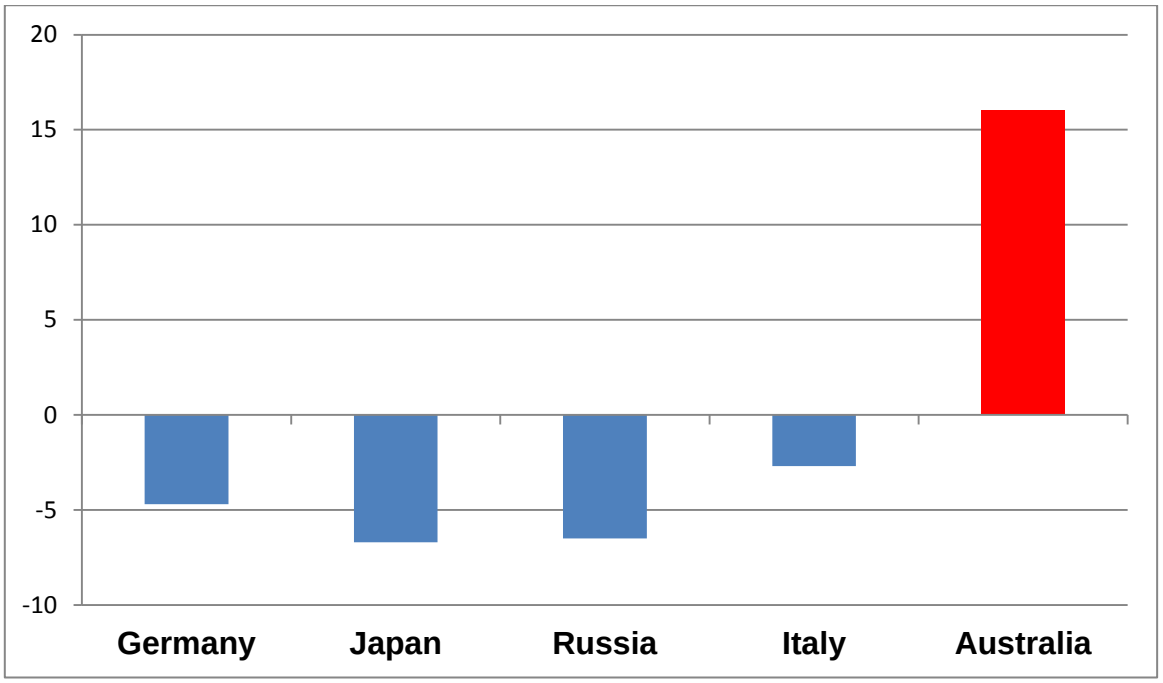
In other commodities, Australia faces nations that are both partners and competitors. For steel this includes China, Taiwan, South Korea and Japan.

Across energy intensive commodities, Australia competes with 40 nations, three-quarters of which are developing economies.

Australia's population growth is growing strongly, while falling elsewhere

One of the key determinants of a nation's emissions footprint is population growth. Targets must take account of the great differences in projected population growth over the period to 2030. According to United Nations projections, Australia's population will *grow* by 16 per cent (3.8 million people) between 2015 and 2030. Over the same period, Germany's population will *fall* by 4.7 per cent (3.9 million), Japan's by 6.7 per cent (8.4 million), Russia's by 6.5 per cent (9.3 million) and Italy's by 2.7 per cent (1.7 million).

Graph 7: Projected population growth 2015-2030 (per cent)



Source: United Nations Population Fund

3. AUSTRALIA'S 2030 TARGET MUST BE BASED ON COMPARABLE EFFORT, NOT IDENTICAL TARGETS.

Australia must not simply adopt an interim target adopted by other nations (or groups of nations). Identical targets do not mean comparable sacrifice.

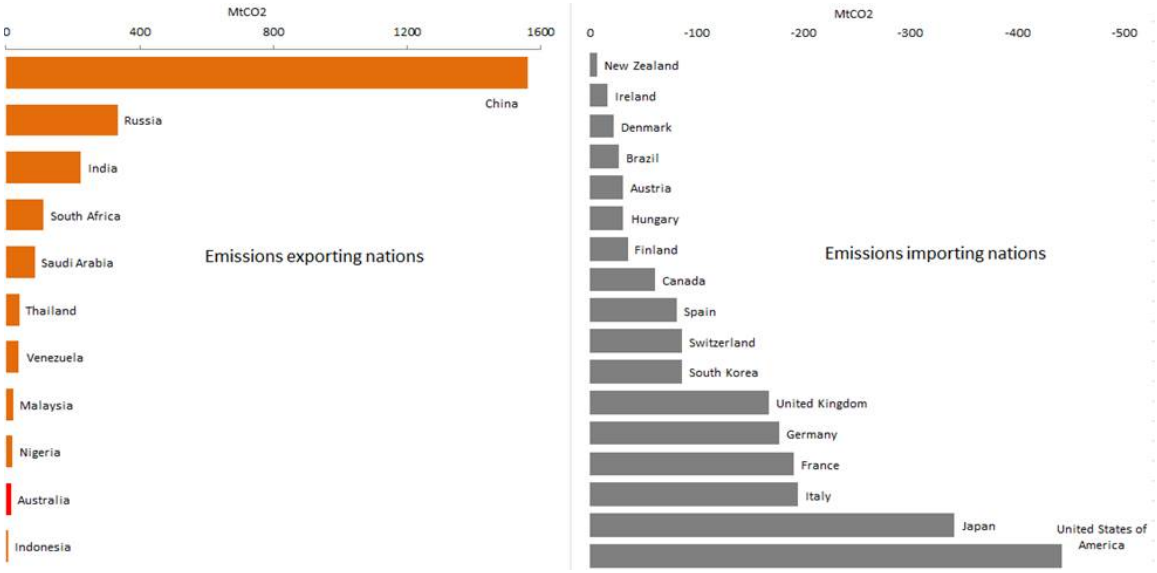
The 'per capita' emissions test is misleading

Some critics point to Australia's high per capita emissions as indicative of an inadequate approach to emission reductions. This approach is gravely flawed – it assumes that the world's population is divided into roughly 200 units of identical geography and topography, resource endowment, stage of development, population growth, age composition, life expectancy, economic growth levels and prospects, access to technology, political structure and environmental amenity.

A focus on per capita emissions ignores the complementarity that underpins global commerce. It fails to take account of the fact that nations generate emissions in the production of goods and services consumed by others. It ignores the fact that if nations decide to end the production and export of certain products (in order to reduce emissions) then the consequences for both nations could be dire. More than one quarter of Australia's emissions are generated in agricultural and minerals production, most of which is exported.

In effect, many developed countries 'outsource' their emissions to developing countries (and countries like Australia that are major producers of emissions intensive products). This gives the misleading impression that developed countries are lowering emissions while developing nations (and major exporters like Australia) are increasing theirs. Graph 8 illustrates this point. The left side of the graph shows the emissions 'embedded' in exports – most of these nations are developing countries. The right side of the graph shows the nations that 'sub-contract' their emissions to other nations.

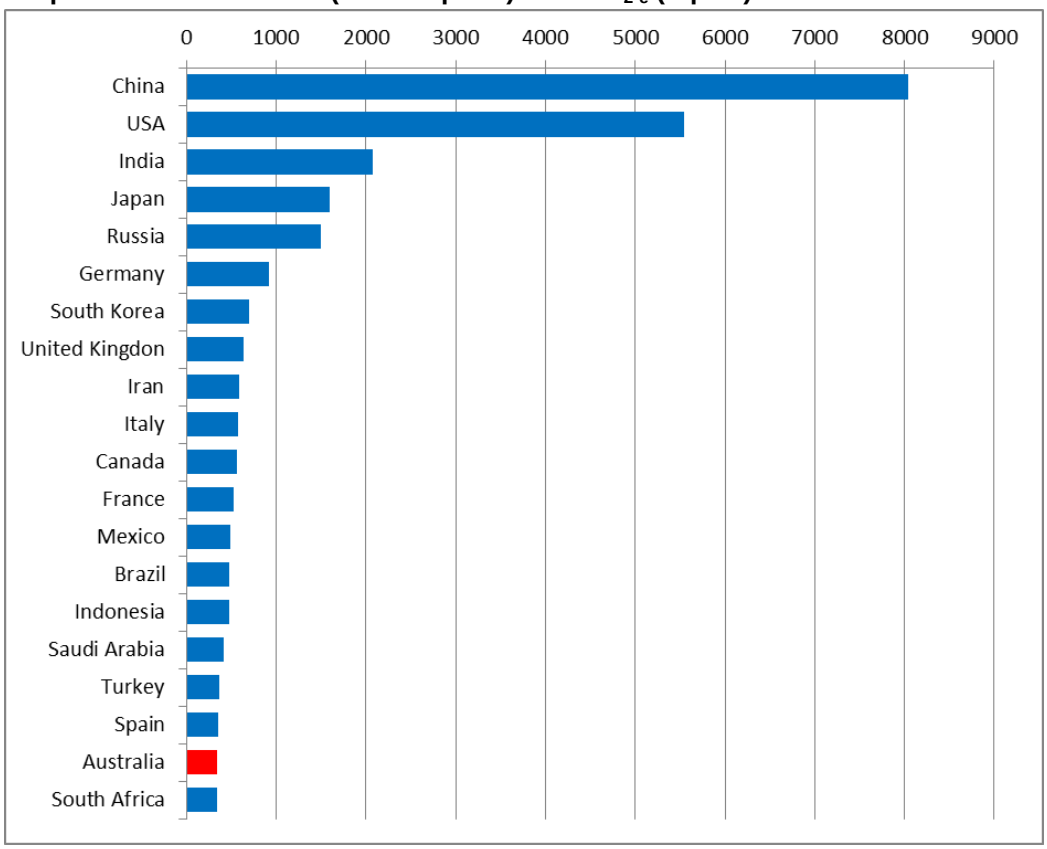
Graph 8: Emissions imports and exports



Source: Global Carbon Project

The same point is illustrated in a different way in Graph 9 below. It assess emissions where they are they are 'consumed', not where they are 'produced'. On this evaluation, Australia ranks well down the G20 scale.

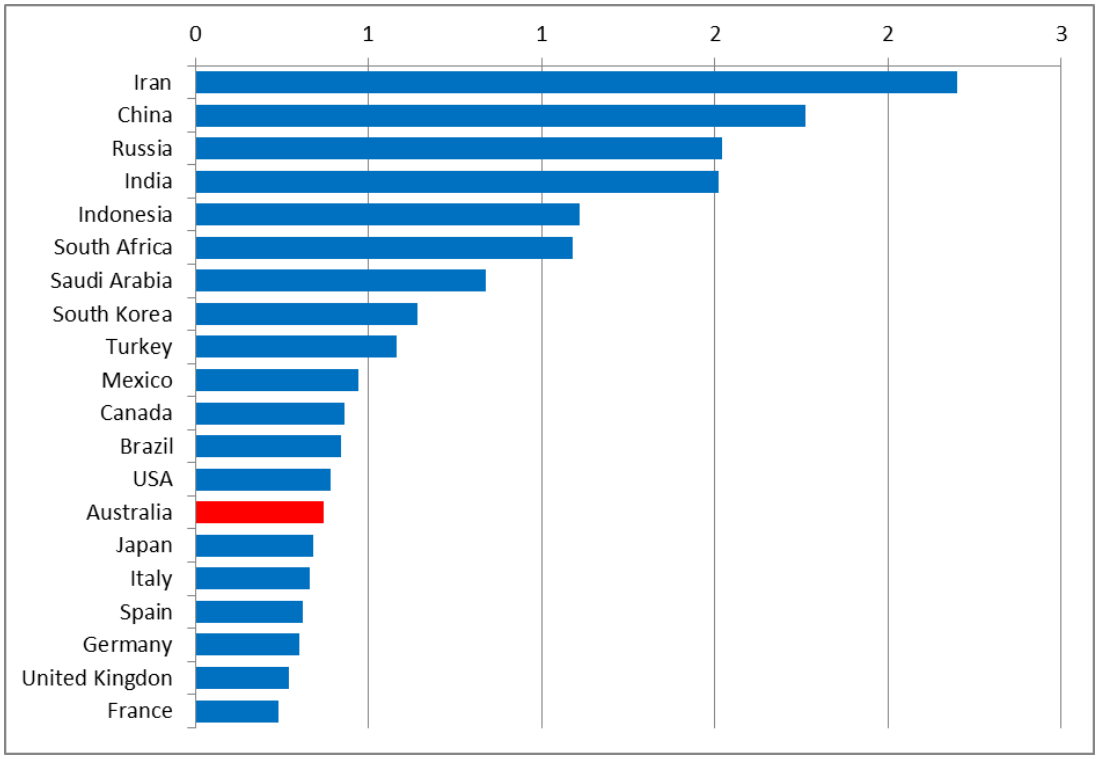
Graph 9: Total emissions (consumption) – Mt $CO_{2\text{-}e}$ (top 20) nations



Global Carbon Project; MCA calculations

In similar vein, Graph 10 analyses the relative performance of nations based on CO_{2e} *consumption* as a proportion of gross domestic product.

Graph 10: Consumption emissions/GDP – kg $CO_{2\text{-}e}$ /GDP (top 20) nations



Global Carbon Project; MCA calculations

4. THE CCA RECOMMENDATION OF CUTS BETWEEN 40 AND 60 PER CENT BY 2030 TAKES NO ACCOUNT OF ECONOMIC IMPACT.

In its *Review of the Caps and Targets* in 2014, the CCA recommended that Australia consider emission reductions of between 40 and 60 per cent off 2000 levels by 2030. Such a reduction, of at least 234 Mt, is equivalent to the combined total of all electricity and agriculture emissions today.

This recommendation did not give due weight to the domestic economic costs, specifically across sectors and regions, of Australia's *existing* abatement targets when it urged still deeper immediate cuts in the future. The CCA gave no weight to the domestic economic impacts of increasing the reduction targets past 2020. Instead the CCA simply took a mechanistic top-down approach of allocating to Australia part of what the Authority defines as the global challenge while overlooking the relative cost to the Australian economy and it capacity to pay.

The recommendation lacked economic foundation and rigour. It was derived uncritically from a synthesis study which summarised an extremely wide range of results, with no guarantee of consistency across the different individual studies covered.[20] The results presented are so sensitive to specification that they are of very limited use. The authors themselves concede this is a major limitation of their analysis.

The analysis took no account of the underlying economics of mitigation by different countries. The cost effectiveness criteria (which is a partial consideration of economic effects) only includes 4 studies (and only for the 2030 targets), none of which included Australia as a separately modelled economy. In addition, in these studies the sectoral aggregation was too broad to capture key Australian industries. The study failed to capture Australia's key economic features which would allow careful analysis of appropriate targets. Given Australia's world leading modelling capabilities, it seems strange to refer to international studies which do not cover Australia as an important component of the analysis.

The CCA has conspicuously failed to consider Australia's comparative advantage in agricultural and resources production and export. In doing so, it has also failed to consider the fact that many nations, not just in East Asia, rely on Australia for the steady and uninterrupted supply of coal, gas and uranium for energy production, livestock exports for protein and coking coal, metals and ores for infrastructure development. In effect, Australia provides these nations with the resources that they cannot provide themselves. As a result of these trade flows, Australia's emissions levels are higher, including in per capita terms. This is because the $CO_{2\text{-}e}$ emitted in the production and processing of packaged beef is counted against Australia, not the 57 countries that import it. Similarly the emissions generated in the extraction and processing of copper exports are counted against Australia not the 12 main receiving countries.

These realities cannot be simply waved away by the CCA or other contributors to the national debate over Australia's emissions reduction targets. Failure to take account of the realities of Australia's economic structure – and the contribution Australia makes to regional economies as a major commodity exporter – will result in the choice of a target that will damage the Australian economy and the living standards of average Australians.

[20] N. Höhne, M. den Elzen, D. Escalante, Regional GHG reduction targets based on effort sharing: a comparison of studies. *Climate Policy*, Vol 14 Number 1 pp 122-147. Published online in October 2013.

5. AUSTRALIA'S 2030 EMISSIONS REDUCTION TARGET ***MUST*** BE BASED ON COMPREHENSIVE ECONOMIC ANALYSIS.

The development of Australia's 2030 emissions reduction target must be informed by comprehensive analysis (including economic modelling) that measures the economic impact on all major national industry sectors and states and territories. To adopt an emissions reduction target without such analysis would be reckless and foolhardy.

Australia's approach should resemble that which informed the setting of Australia's emissions target in the lead up to the 1997 COP3 talks in Kyoto. Australia's approach to that negotiation was backed by detailed, real time and dynamic analytical tools that were utilised to examine the cost and economic impacts on individual (and sub-sectors) of achieving possible emissions targets by sector (and some key subsectors) including measures of impacts on output, employment, input costs and flow on effects to the overall economy. The comprehensive and real time nature of the modelling provided the then Australian Government with an up to date assessment of the implications of different emissions targets. Australia's contribution to the necessarily collective effort should be economically comparable.