Australia’s upcoming pollution reduction target announcement: How to make sense of it
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2012-14

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Governments from around the world will gather in Paris in December to finalise the international framework through which the world will facilitate carbon pollution reductions post-2020. Paris is a critical milestone for setting domestic ambition, since its countries’ own policies, not international treaties, that reduce emissions.

The science is loud and clear: the world is warming, largely driven by rising emissions from burning fossil fuels. The world’s leading scientists have concluded that global warming of 2°C or more above pre-industrial levels will result in irreversible and catastrophic consequences. Over 190 nations, including Australia, have committed to avoiding 2°C. As the G7 recently highlighted, the recognition that this requires the decarbonisation of the global economy is now mainstream.

In mid-2015, the federal government will announce its draft offer to the international community on Australia’s post-2020 emissions reduction targets. This will be the government’s biggest policy decision on climate change and renewable energy to date, and a key test of its commitment to avoiding 2°C of global warming.

The scale of Australia’s post-2020 emissions reductions goals will have a big influence on domestic climate policy like energy policies and emissions limits on major emitting facilities. Good policy design can modernise the economy and maximise Australia’s abundant economic opportunities in clean energy and carbon services, it can also manage the transition from our high carbon past.

What will the target look like?

Targets for industrialised countries are usually expressed as a percentage reduction on a previous baseline year, by a particular target date. Currently proposed targets for Australia’s peers are in the appendix. For example:

Paris will likely provide an enduring international framework within which countries have a requirement to implement progressively stronger targets. Learning from 20 09’s Copenhagen climate summit, countries have agreed to advance initial targets well ahead of the Paris meeting in December. These targets are called Intended Nationally Determined Contributions (or INDCs). As they are nationally determined, countries have flexibility, at this point, around whether the targets are for 2025 or 2030 and whether or not they announce a longer-term target to 2050.

These are also indicative targets. Targets for 2025 or 2030 will not be finalised in Paris but will be attached once the details of the framework are clarified, likely in late 2016, possibly 2017.

What will it mean? How to judge the government’s initial target?

The Climate Institute has developed three key benchmarks to test the initial post-2020 target when it is announced:

+ Is the target effective in addressing climate change?
+ Are we lagging, matching or leading compared to our peers?
+ Are we positioned to remain competitive in a world limiting emissions?

The first is the primary test and core to climate credibility – will the pollution reduction pathway contribute to a lower or high risk chance of avoiding 2°C warming, or contribute to higher catastrophic warming levels? Secondary benchmarks compare performance against the emissions intensity and per capita pollution of international peers as well as examine changes to the projected carbon productivity of our economy.

Australia will reduce emissions by (40%, etc.) on 2005 emissions levels by 2025, and a (80%, 100%, etc.) reduction by 2050.
Is the initial target effective in addressing climate change?

It was agreed internationally that countries should justify how their target is consistent with a fair and ambitious contribution towards avoiding 2°C of warming. The ambition of Australia’s initial target, as a proportion of global efforts, will imply a level that the government is prepared to accept, for example 2, 3 or 4 degrees of global warming.

Table 1 outlines estimated implied global warming scenarios from four emissions pathways to 2050. The climate system is more concerned with the accumulation of pollution than emissions in any given year. These calculations are therefore based on the total amount of emissions that Australia would release into the atmosphere over the period to 2050. This "carbon budget" approach to calculating a contribution to climate change, was recommended by The Climate Institute and the Climate Change Authority. These calculations also assume other countries take comparable action to Australia’s target. If we take this level of action we cannot expect other nations to do more than their fair share and do our heavy lifting for us.

Pollution reductions of 45 per cent on 2005 levels by 2025 and 65% by 2030 would see a lower risk contribution to avoiding 2°C warming. Targets of just 30 per cent by 2030 would contribute to risks of more than 3°C warming.

How does Australia compare to its peers?

Making comparisons of national targets is fraught with difficulty as no single measure can give a picture of a nation’s ambitions, capability and responsibility to respond to climate change.

Comparisons also often confuse the ambition of the target with economic costs. The level of Australia’s post-2020 target won’t determine its net cost or benefit, nor its impact on specific economic sectors. These are largely determined by the quality of the domestic policies and measures put in place to achieve the target (e.g., access to international permits and assistance for genuinely trade exposed industry).

However, as comparisons will be made, The Climate Institute has defined benchmarks for whether Australia’s target will put us on a path to match, catch up or lag behind compared to our peers internationally - the US, EU countries, Canada, Japan, New Zealand, Switzerland and Norway.

Matching Australia’s per capita pollution and emissions intensity levels to the average of these countries would require reductions of 55-65 per cent by 2025. Catching just the USA on per capita pollution and emissions intensity levels, would need Australia to reduce pollution by around 40 per cent on 2005 levels by 2025. Australia would still be lagging the USA on these levels by five years with a 2025 target of 20 - 35 per cent.

Table 1: Illustrative impacts of different global temperature change on Australia.

<table>
<thead>
<tr>
<th>Australian carbon budget to 2050</th>
<th>Example targets consistent with carbon budget (on 2005 levels)</th>
<th>Implied global temperature increase</th>
<th>Example climate change impacts on Australia</th>
</tr>
</thead>
<tbody>
<tr>
<td>24-28 billion tonnes</td>
<td>Current business as usual projections (&gt;30% increase in emissions to 2030)</td>
<td>1 in 3 chance of &gt;4°C</td>
<td>Severe damage to settlements, infrastructure and human health from climate extremes; large areas of agricultural land rendered unfit for production; few coral reefs remain</td>
</tr>
<tr>
<td>16-19 billion tonnes</td>
<td>-15% by 2025, -30% by 2030, -40% by 2050</td>
<td>1 in 3 chance of &gt;3°C</td>
<td>Risks of severe impacts human health and communities from climate extremes; moderate to high risks to food production; few coral reefs remain</td>
</tr>
<tr>
<td>9-10 billion tonnes</td>
<td>-35% by 2025, -45% by 2030, net zero pollution by 2050</td>
<td>1 in 3 chance of &gt;2°C</td>
<td>Risks and damages from extreme weather events increase significantly; coral reefs decline</td>
</tr>
<tr>
<td>7-8 billion tonnes</td>
<td>-45% by 2025, -65% by 2030, net zero pollution by 2050</td>
<td>1 in 4 chance of &gt;2°C</td>
<td></td>
</tr>
</tbody>
</table>

Table continues...
Are we positioned to remain competitive in a world limiting emissions?

Compared to many of our international peers, Australia does have a pollution intensive economy. In a world increasingly focused on decarbonisation, the sooner we start to catch up with others the better off we will be. Further delay will only leave us further behind and needing to change faster to match others. Also, Australia’s historic failure to implement or sustain policies to accelerate emissions reductions means we have more to do to close the gap between us and other nations.

Australia is one of the least prepared G20 countries to remain competitive in a world limiting emissions. Major trading partners from Asia, North America and Europe are implementing measures to price carbon, limit emissions, improve energy productivity, and grow renewable energy supply. These countries are acting because they see it is in their economic interest to do so. Reducing damaging pollution, creating new industries and jobs, building energy security, and, positioning themselves to take advantage of the emerging clean economy are central to their efforts to enhance the prosperity of their citizens.

Ultimately, as the recent G7 leaders communique highlighted, there is a growing mainstream recognition that economies need to be at net zero emissions or below well before the end of this century. The scientific community has concluded that for a higher chance of avoiding 2°C warming net global CO₂ emissions from energy and industrial activities need to be zero by 2050.

A broad proxy for a nation’s position in a world limiting pollution is its ‘carbon productivity’ (dollars of GDP per tonnes of emissions). As global emissions constraints are progressively tightened, countries which can produce more GDP from each tonne of emissions will be able, other things being equal, to provide a greater level of well-being to their residents than those countries that produce less GDP for each tonne of emissions.

However, Australia’s current rate of carbon productivity improvement is about 6 per cent per year but would decline to four per cent per year with no significant action. Relatively weak targets including 30 per cent by 2030 may just sustain the current rate.

Targets consistent with those recommended by The Climate Institute or the Climate Change Authority would increase carbon productivity to around 8 per cent per year to 2025. This, and a pathway to decarbonisation of the Australian economy before 2050, would be in line with global action to limit global warming to less than 2°C.
Why is Australia’s post-2020 target important?

Negotiators, ministers and heads of state from around the world will gather in Paris in December 2015 to finalise the international framework through which the world will reduce carbon pollution post-2020.

Paris is a critical milestone for setting domestic ambition, since its countries’ own policies, not international treaties, that reduce pollution.

The science is loud and clear: the world is warming, driven largely by rising emissions from burning fossil fuels. The Intergovernmental Panel on Climate Change (IPCC), the world’s leading body of climate scientists, has outlined that the warming of 2°C or more above pre-industrial levels would have severe and irreversible impacts on people, economies and natural systems.¹

Over 190 nations, including Australia, have committed to avoiding 2°C.

As part of the preparations for the Paris climate summit in December 2015, countries have agreed to announce their initial post-2020 targets this year. These targets should be more ambitious than current 2020 targets and demonstrate a fair and ambitious contribution to avoiding a 2°C increase in global temperature.²³

The government has stated that Australia will announce its target mid-year. This will be the government’s biggest policy decision on climate change and renewable energy to date, and a key test of its commitment to the internationally-agreed goal of avoiding 2°C of global warming.

The scale of Australia’s post-2020 emissions reductions goals will have a big influence on domestic climate policy. For example, policies like the Renewable Energy Target were originally implemented as part of the Howard government’s actions to meet Australia’s first Kyoto target. The previous government, calibrated its default emission limit under the former emissions trading scheme to reduce pollution by at least 12 million tonnes a year. This was done to ensure Australia met its minimum international commitments.⁴

Internationally, the scale of Australia’s target will influence the ambition of some of our international peers. If it is weak, this will give some emerging economies an excuse to reduce their own ambition. Global action matters to Australia, as this is the only way very severe climate change impacts in this country can be avoided.
How to judge the government's announced target?

The Climate Institute has developed three key benchmarks to test the post-2020 target when it is announced:

+ Is the target effective in addressing climate change?
+ Are we lagging, matching or leading compared to our peers in a low carbon world?
+ Are we positioned to remain competitive in a world limiting emissions?

Is the target effective in addressing climate change?

The entire point of international and domestic action to reduce pollution is to avoid dangerous levels of climate change. With bipartisan support, Australia has agreed with over 190 other countries that the maximum level of global warming we should allow is 2°C above pre-industrial levels. Many vulnerable countries have called for a revision of this goal due to the mounting evidence that 2°C of warming will push some communities beyond their ability to adapt. They suggest a 1.5°C degree maximum level would be more appropriate.

Ultimately, as the recent G7 leaders communique highlighted, there is a growing mainstream recognition that economies need to be at net zero emissions or below well before the end of this century. The scientific community has concluded that for a high chance of avoiding 2°C warming net global CO2 emissions from energy and industrial activities need to be zero by around 2050.

The unavoidable arithmetic and physics of the climate system are that zero emissions (and below) is the only way dangerous climate change will be avoided. This reality is recognised by institutions such as the OECD and World Bank through to multinational companies like Unilever and the Virgin Group.

It is also important to note that Australia signed up to the 2°C goal for very good reasons. Warming above this level would pose particular challenges for our nation (Table 2).

Table 3 outlines estimated implied global warming scenarios from several levels of Australian emissions to 2050. This uses the total amount of emissions to 2050 – a ‘carbon budget’ approach – to calculating a contribution to climate change, as recommended by The Climate Institute and the Climate Change Authority. To remain within a certain carbon budget a range of emissions pathways are possible. Examples of the kinds of emissions reductions consistent with the range of carbon budgets are also shown.

Note that the concept of a carbon budget is very important to science-based climate change policy. Whether we avoid dangerous impacts are a product of the total amount of pollution we put into the air not emissions in any given year. The word budget is used deliberately – the more you spend now the less you have to spend later. Figure 1 illustrates this point. In this scenario, Australia does not set a science-based emissions target until after 2030. Because little action is taken until 2030, emissions after this point need to fall to nearly zero in less than a decade to meet global temperature goals.
Table 2: Illustrative impacts of different global temperature change on Australia.\textsuperscript{13-14}

<table>
<thead>
<tr>
<th></th>
<th>&lt;2°C</th>
<th>2-3°C</th>
<th>&gt;4°C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Food production</strong></td>
<td>Risks to agriculture in Murray Darling Basin (MDB) and southern Australia low with adaption</td>
<td>Risks to agriculture in MDB and southern Australia moderate to high with adaption (e.g. irrigated agriculture in the MDB falls by 12–49 per cent)</td>
<td>Large areas of agricultural land rendered unfit for production Strains on domestic capacity to meet food demand (e.g. irrigated agriculture in the MDB falls by 90 per cent)</td>
</tr>
<tr>
<td><strong>Flood risk, drought, heat waves and bushfires</strong></td>
<td>Risks and damages increase significantly but changes remain within estimated adaptive capacity</td>
<td>Risks and damages increase significantly (e.g. very extreme bushfire days are projected to occur four to five times as often in southeast) Estimated adaptive capacity is stretched risking severe impacts</td>
<td>Severe damage to settlements, infrastructure and human health (e.g. thousands of additional heat-related deaths are year, water supplies struggle to meet demand)</td>
</tr>
<tr>
<td><strong>Great Barrier Reef</strong></td>
<td>Corals reef decline; vastly reduced complexity and significant loss of biodiversity</td>
<td>Reef diversity and complexity devastated, few reef-building corals remaining</td>
<td></td>
</tr>
</tbody>
</table>

Table 3: Implied global warming scenarios from several levels of Australian emissions to 2050. These calculations assume other countries take comparable action to Australia’s target, i.e. if we take this level of action we cannot expect other nations to do more than their fair share.

<table>
<thead>
<tr>
<th>Total emissions or ‘carbon budget’ to 2050</th>
<th>Implied global temperature increase</th>
<th>Example targets consistent with carbon budget (on 2005 levels)</th>
</tr>
</thead>
<tbody>
<tr>
<td>24-28 billion tonnes</td>
<td>1 in 3 chance of &gt;4°C</td>
<td>Current business as usual projections (&gt;30% increase in emissions to 2030)</td>
</tr>
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<td>16-18 billion tonnes</td>
<td>1 in 3 chance of &gt;3°C</td>
<td>-15% by 2025, -30% by 2030, -40% by 2050</td>
</tr>
<tr>
<td>9-10 billion tonnes</td>
<td>1 in 3 chance of &gt;2°C</td>
<td>-35% by 2025, -45% by 2030, -100% by 2050</td>
</tr>
<tr>
<td>7-8 billion tonnes</td>
<td>1 in 4 chance of &gt;2°C</td>
<td>-45% by 2025, -65% by 2030, -100% by 2050</td>
</tr>
</tbody>
</table>

Figure 1: The carbon cliff - delayed action and carbon budgets: Note that in this scenario, Australia continues its current rate of emissions reductions to 2030, and achieves around a 20 per cent reduction in emissions, on 2005 levels, at this time (no progression). After 2030 emissions reductions are accelerated to achieve the Climate Change Authority’s total emissions budget to 2050. To stay within this 2°C carbon budget emissions need to fall to nearly zero in a decade. The more steady range of emissions reductions consistent with 2°C carbon budgets, as recommended by The Climate Institute and the Climate Change Authority, are also shown.

![Figure 1: The carbon cliff - delayed action and carbon budgets](image-url)
Are we lagging, matching or leading compared to our peers internationally?

Making comparisons of national targets is fraught with difficulty as no single measure can give a picture of a nation’s ambitions, in addition to its capability and responsibility to respond to climate change.  

Critically, comparisons often confuse the ambition of the target with any cost of reducing emissions. The level of Australia’s post-2020 target won’t determine its net cost or benefit, nor its impact on specific economic sectors. These are largely determined by the quality of the domestic policies and measures put in place to achieve the target. Impacts of these policies may be managed by, for example, providing access to international carbon markets or assistance for certain sectors.

Also, Australia’s historic failure to implement policies to accelerate emissions reductions means we have much to do to close the gap between us and other nations (Figure 2). In recent years, the government has also significantly weakened the domestic emissions reduction framework (for example, reviewing the Renewable Energy Target, and abolishing the carbon laws limit on industrial emissions). This historic reality needs to be considered when comparing national ambitions. Should Australia be rewarded for increasing its emissions compared to other countries?

As outlined, comparing targets is a dangerous exercise. However, as comparisons will be made, The Climate Institute has defined whether Australia’s target puts us on a path to match, catch up or remain a laggard compared to our peers internationally:

+ **Match our peers:** To match our peers, Australia’s per capita and emissions intensity levels achieve the average of our international peers. Based on currently proposed targets by the USA, EU, Canada the UK, Germany, Norway and Switzerland this would require Australia to reduce pollution by around 55-65 per cent on 2005 levels by 2025.

+ **Starting to catch up with our peers:** Australia’s per capita and emissions intensity approximately align with the USA by 2025. Based on the USA’s currently proposed target this would require Australia to reduce pollution by around 40 per cent on 2005 levels by 2025.

+ **Lagging behind our peers:** Australia’s per capita and emissions intensity levels achieve the USA’s 2020 levels but five years later in 2025. Australia’s pollution reduction target would be around 20-35 per cent on 2005 levels by 2025.

Figure 2: Emissions per person and the emissions intensity of the economy (CO2e/GDP PPP) for Australia under different scenarios. This shows Australia’s current levels on these indicators and compares them to the levels that would need to be achieved in 2025 to match, catch or lag our international counterparts. Levels in 2020 are also shown based on Australia’s minimum international commitment and the target recommended by the Climate Change Authority.
Are we positioned to remain competitive in a world limiting emissions?

Australia is one of the least prepared G20 countries to remain competitive in a world limiting emissions. In particular, we have an emission intensive economy and energy system, have used energy relatively inefficiently, and have continued to extract natural capital at a relatively high rate.

Australia currently lacks a strategy to manage the risks and capitalise on the opportunities of global action to reduce emissions. Major trading partners from Asia, North America and Europe are implementing measures to price carbon, limit emissions, improve energy productivity, and grow renewable energy supply. These countries are acting because they see it is in their economic interest to do so. Reducing damaging pollution, creating new industries and jobs, building energy security, and, positioning themselves to take advantage of the emerging clean economy are central to their efforts to enhance the prosperity of their citizens.

While our large fossil fuel resources, emissions intensive exports, and high proportion of coal-fired electricity generation have contributed to national prosperity in the past, their future contribution is in serious doubt. Failure to adapt to the emerging carbon-constrained world will not preserve our prosperity, nor will shielding industries protect them from change. Australia’s ability to capitalise on the trends toward a net zero carbon world will, to an extent, determine our future economic competitiveness and ability to create prosperity for our nation.

It is usually assumed that “doing too much” to reduce emissions will be detrimental to the Australian economy. There is some truth in this, but it fails to appreciate that weak action also has economic consequences. Lack of a credible long-term signal to business that Australia will play its part in decarbonising the global economy will create ongoing uncertainty over domestic climate and policy that would deter business investment. It will also hold us back from developing new, clean-tech industries at the same time as demand for our natural resources declines due to other countries’ taking stronger climate action. Finally, it may also encourage investment in emissions intensive activities which will become stranded as inevitable and stronger future actions take effect.

A broad proxy for a nation’s position in a world limiting pollution is its “carbon productivity”. As global emissions constraints are progressively tightened, countries which can produce more GDP from each tonne of emissions will be able, other things being equal, to provide a greater level of well-being to their residents than those countries that produce less GDP for each tonne of emissions.

Historically, Australia’s carbon productivity has improved by around six per cent per year. This improvement is currently projected to slow to around 4 per cent a year to 2025. This would create a growing gap between the carbon productivity improvements consistent with a prosperous zero-carbon economy, and one which is out of date and vulnerable to growing global economic trends.

Australia’s current rate of carbon productivity improvement is about 6 per cent per year but would decline to four per cent per year if business as usual continues. Relatively weak targets including 30 per cent by 2030 may just sustain the current rate. Targets consistent with those recommended by The Climate Institute or the Climate Change Authority would increase carbon productivity to around 8 per cent per year to 2025 (Figure 3). This, and a pathway to decarbonisation of the Australian economy before 2050, would be in line with global action to limit global warming to less than 2°C.

Figure 3: Australia’s carbon productivity.\(^{21}\)
### Appendix 1: Draft or initial post-2020 targets.

<table>
<thead>
<tr>
<th>Country</th>
<th>Target (official)</th>
<th>Emissions reductions in 2025 on different base years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>2005 levels</td>
</tr>
<tr>
<td>USA</td>
<td>+ 26-28% below 2005 by 2025 + ~80% below 2005 by 2050</td>
<td>-26 to -28%</td>
</tr>
<tr>
<td>EU</td>
<td>+ 40% below 1990 by 2030 + 80-95% below 1990 by 2050</td>
<td>-23%</td>
</tr>
<tr>
<td>Japan</td>
<td>+ (draft) 26% below 2013 by 2030 (25% below 2005) + 80% below 1990 by 2050 (in domestic law)</td>
<td>-14%</td>
</tr>
<tr>
<td>Canada</td>
<td>+ 30% below 2005 by 2030</td>
<td>-24%</td>
</tr>
<tr>
<td>UK</td>
<td>+ 50% below 1990 by 2025 (in domestic law) + 80% below 1990 by 2050 (in domestic law)</td>
<td>-41%</td>
</tr>
<tr>
<td>Germany</td>
<td>+ 55% below 1990 by 2030 (in domestic law) + 80-95% below 1990 by 2050 (in domestic law)</td>
<td>-37%</td>
</tr>
<tr>
<td>Norway</td>
<td>+ 40% below 1990 by 2030 + 100% below 1990 by 2050</td>
<td>-16%</td>
</tr>
<tr>
<td>Switzerland</td>
<td>+ 50% below 1990 by 2030 + 70-85% below 1990 by 2050</td>
<td>-35%</td>
</tr>
</tbody>
</table>

- ■ indicates the target is an average or stronger target against the respective base year.
- ■ indicates the target is weaker than the average for the base year.
- ■ indicates an increase in emissions against the base year.
Endnotes


3 Climate Change Authority, 2014, International climate action: priorities for the next agreement, CCA, Melbourne

4 Australia’s international commitments are related to the range of international 2020 undertakings they have made under the UNFCCC’s Cancun Agreements and Kyoto Protocol. This includes reducing emissions by 5-15 or 25 per cent below 2000 levels by 2020. Higher targets are subject to specific conditions that Australia has communicated to the international community and have had bipartisan support. The conditions to move to higher targets than the minimum 5 per cent have been met.


6 The UNFCCC carried out a Structured Expert Dialogue across 2013-2015 on the topic of the long-term temperature goal. They found that ‘The ‘guardrail’ concept, in which up to 2 °C of warming is considered safe, is inadequate and would therefore be better seen as an upper limit, a defence line that needs to be stringently defended, while less warming would be preferable.’ The full report is available here - http://unfccc.int/resource/docs/2015/sb/eng/inf01.pdf


8 For more information see The Climate Institute’s report Moving Below Zero: Understanding Bio-energy with Carbon Capture and Storage that was released in April, 2014.


10 These calculations assume a generous emissions allocation to Australia of around 0.8 per cent to 1 per cent of the global carbon budget (Australians account for 0.33 per cent of the global population). Two degree carbon budgets are consistent with those used by the Climate Change Authority for a greater than 67 per cent chance and 75 per cent chance of avoiding 2°C respectively. The 3°C and 4°C budgets (67 per cent chance of avoiding) are estimated from the Intergovernmental Panel on Climate Change’s Fifth Assessment report. If the government does not announce a long-term (e.g. “2050”) emissions target, The Climate Institute will assume that annual rate of emissions reductions will remain constant in the period after the announced target period.

11 The Climate Institute, 2013, Operating within Limits: defining an Australian Carbon Budget, TCI, Sydney: http://tinyurl.com/o5d8a6k


16 Emissions data is sourced from the UNFCCC and economic data is from the IMF.


20 Emissions data is sourced from the UNFCCC and economic data is from the IMF.

21 The approach used here is similar to that appointed by Vivid Economics in its report on low carbon competitiveness. In line with the findings of the Intergovernmental Panel on Climate Change’s Fifth Assessment report, this calculation also assumes that advanced economies like Australia need to reduce emissions by 50 per cent on 2010 levels by 2030 to play their part in avoiding 2°C. Emissions data is sourced from the UNFCCC and Australian Department of the Environment. Economic data is from the IMF and based on $PPP values.