



## Briefing Paper 2

# What does climate leadership and a 'fair share' look like?

October 2015

This Briefing Paper is based on the *Nature Climate Change* publication, 'National post-2020 greenhouse gas targets and diversity-aware leadership', by Dr Malte Meinshausen and others<sup>1</sup>. The paper is also the basis for an interactive webtool that allows users to determine how much each country will need to reduce its annual greenhouse gas emissions for the world to stay within the 2°C guardrail. It can be viewed at [www.mitigation-contributions.org](http://www.mitigation-contributions.org).

### Executive Summary

A major barrier to global climate action is an inability by nations to agree on a fair way to share the emissions reduction burden. There are two broad views on this. Distributive justice calls for emission allowances to be distributed equally across the global population. Corrective justice calls for emission allowances to be distributed in such a way that people from countries with the highest historical emissions play a greater role in reducing future emissions. This paper suggests an alternative approach that it calls 'diversity-aware leadership'. Under such an approach, a likely chance of keeping global warming within 2°C is maintained, and each nation is free to choose its own form of justice, provided there is strong leadership from one major economic power and other countries agree to match the leader's effort.

For the United States to show such leadership it would have to adopt a 2030 target of -75% on 2010 levels. Matching that effort would require the following 2030 pledges:

- European Union: -50%
- China: -4%
- Australia: -65%

Leadership from the EU would require it to adopt a 2030 target of -61% on 2010 levels. Matching that effort would require the following 2030 pledges:

- US: -59%
- China: -6%
- Australia: -50%

Climate leadership from Australia would require it to adopt a 2030 target of -66% on 2010 levels, which is the same as reducing 2005 emissions by 68%. This is almost three times more ambitious than Australia's current target.

## What does climate action leadership look like?

At international climate change talks in 2010, governments agreed to the 2°C ‘guardrail’: the goal of limiting global warming to within two degrees of pre-industrial temperatures. If the 2°C guardrail is to be observed, only a limited carbon budget remains to be divided between all nations. Ultimately, the world needs to be on a trajectory to zero net emissions, but on that road to zero emissions there is an unanswered question over who gets to emit how much over the coming decades. This issue is blocking climate change negotiations.

The deadlock relates to the different perspectives nations hold on what is a fair way to distribute emissions reduction efforts. There may be a way to break this deadlock. It requires one country to show leadership by doing what initially seems like more than its fair share. In response, every other country follows suit by doing as much as — but not more than — the leading country. Each country is allowed to choose the method by which it defines its own fair share.

## The climate deadlock

Five years after the 2°C guardrail was agreed upon, the world is not on track to meet its goal. The Intergovernmental Panel on Climate Change (IPCC) — the United Nations scientific review body for climate change — outlines multiple scenarios of what needs to be done on a global level to stay within the 2°C guardrail (see Box 1). However, the IPCC provides little detail at the country level. Discussions over country-level emissions allocations (also known as ‘burden-sharing’) dominate international climate change meetings.

These meetings take place within the United Nations Framework Convention on Climate Change (UNFCCC). As a framework convention, the UNFCCC outlines the broad objectives of climate change negotiations and the principles by which they are guided.

When the UNFCCC was adopted in 1992, just 22% of the global population, namely those from the most developed countries, was responsible for almost half of global annual greenhouse gas emissions. In light of this

large dichotomy between the richer and poorer nations the principle of ‘common but differentiated responsibilities’ was adopted. This principle divides the industrialised and developing nations by placing the onus on the richer countries to do most of the early and heavy lifting in climate change action.

### BOX 1: Staying on track for 2°C

To maintain a good chance of staying within the 2°C guardrail there is a limit to the volume of greenhouse gases that can be emitted. According to the IPCC, that limit is 1010 billion tonnes of carbon dioxide (after 2011) for a 66% chance of not breaching the guardrail. To relate that 1010-billion-tonne carbon budget to annual emissions, hundreds of scenarios from the IPCC and other sources were evaluated against the remaining carbon budget. As illustrative benchmarks, the *Nature Climate Change* paper found that to stay within the guardrail:

- in 2025, global emissions must not exceed 1990 levels by more than 10%;
- in 2030, global emissions must not exceed 1990 levels.

While this principle remains a strong influence in negotiations, the country divide is no longer so sharp. In 2014, developed countries were responsible for no more than one-third of global emissions. China, in contrast, was responsible on its own for more than a quarter of all greenhouse gas emissions in that year. This shift away from a purely dichotomous distinction between nations opens the door to a more complex approach to climate equity.

## Two views of ‘fairness’

Against this backdrop, the discussion on equity or ‘fairness’ is politically contentious. There are many different views and theories on what is a fair way to distribute the global emissions reduction effort (and its cost) between countries. Broadly, most discussions on fairness are based on one of two principles: either a distributive

justice approach or a corrective justice approach.

### **The distributive justice approach**

This is where *future* greenhouse gas emissions are allocated over time in such a way that all nations transition to an equal per-person distribution throughout the global population. This approach disregards countries' past emissions. It requires that all countries have equal emissions per person at some defined point in the future.

### **The corrective justice approach**

In contrast, this approach rectifies the imbalance in the distribution of *past* emissions and *future* emissions. It allocates proportionally more future emissions rights to those countries with the lowest historical emissions, on a per-person basis. So, this approach requires that at some defined point in the future all countries will have both:

- Equal current emissions per person, and
- Equal cumulative historical emissions per person.

## **Which 'fairness' should we choose?**

Variations of the distributive and the corrective justice approaches have been proposed in governmental submissions to the UNFCCC. Governments tend to design and support interpretations of equity that best meet their nation's self-interest. That is, a government will choose the justice approach that allows its country the highest level of future emissions.

There is a global common interest in reducing global greenhouse gas emissions; this is why the UNFCCC exists. However, there is national self-interest to take on the smallest possible share of the load. So, while countries show a willingness to agree on a shared outcome of two degrees, they cannot agree on how that outcome can be reached. Countries agree to the 'what' but not necessarily to the 'how' and the 'why'.

Unfortunately, when each country agrees to the 2°C guardrail but applies its own definition of a fair share, the collective outcome exceeds the 2°C guardrail.

So how do we move forward?

One way to solve this problem is to agree on a more stringent global target. For example, if the global target is reduced to 1.5°C and each country is allowed to define its own 'fair' share, the 2°C guardrail might not be exceeded. However, it may not be feasible to get global political agreement on a new guardrail.

Another way is to focus on the relative differences between countries' efforts rather than absolute differences. This method assumes that one country is prepared to do more as long as its neighbours and trading partners also do more. That way, no country is relatively worse off. For this method to work, one country needs to act first, and it needs to do so without prejudice to which equity approach follower countries will choose to adopt: it calls for unconditional leadership that is aware of the diversity of views.

## **Diversity-aware leadership**

A diversity-aware leadership approach would involve one country becoming an ambitious early mover. The leading country sets its own emissions reduction target. Every other country, guided by the leader's target, adopts a commensurate target using either a corrective or a distributive justice approach — each choosing the method that results in a more generous allocation for that country. The leader's target must be ambitious enough that the collective outcome does not breach the 2°C guardrail.

Such leadership would need to come from a major economic power, such as a G20 country, with important trading partners and the geopolitical capacity to lead by example.

The lead country would also need to look beyond its major trading partners to assist other countries, specifically developing countries. The ability of developing countries to commit to stringent emissions-reduction targets is limited by the financial resources available to those countries. On a global scale, it is incumbent on richer countries to provide support to poorer countries. True leadership by a country would be measured by its own emissions pledge plus contributions made to facilitate emissions reduction elsewhere.

## What leadership looks like

Table 1 presents the 2025 and 2030 emissions reduction targets that each of the G20-country members would need to adopt under different settings: a distributive justice world, a corrective justice world, or a world guided by a diversity-aware leader (for how to read the table see Box 2). An emissions reference year of 2010 is chosen because of the availability of comparative data for all countries. Figure 1 provides a graphical representation of four leadership scenarios.

Between them, China, the US and the 28 countries of the EU (EU28) are responsible for 45% of global annual greenhouse gas emissions. As such, these groups are key to any future climate change response and are given special attention in this analysis and in Table 1.

### European leadership

For the EU28 to be an effective leader it would need to announce a 2030 target of 61% below 2010 levels. The US would then follow suit with a target of 59%, while China would need to announce a 6% reduction on 2010 levels. Australia would need to halve its 2010 emissions (or 52% on 2005 levels).

### US leadership

For the US to claim leadership, it would need to pledge to reduce 2010 emissions by 75% by 2030. The EU28 would then need to halve its emissions in that time, while China reduced them 4%. Australia would need to reduce its 2010 level emissions by 65% (or its 2005 level emissions by 67%).

### Chinese leadership

China, to be a leader, would need to adopt a 32% reduction target by 2030 on 2010 levels. This is the same target that would be needed in a world that adopted the distributive justice model. This is because China's historical emissions are low for the size of its population, but future emissions are likely to be high.

The most favourable option for China is that the EU28 adopt a diversity-aware leadership role. In contrast, the EU and the US would be presented with their most favourable options in a world where China shows such leadership.

### Australian leadership

For Australia to be considered a leader it would need to commit to a 41% reduction on its 2010 emission levels by 2025 and a 66% reduction by 2030. On 2000 emissions levels this equates to a reduction of 35% by 2025 and of 63% by 2030. On 2005 levels this is a 44% reduction by 2025 and a 68% reduction by 2030.

#### Box 2: How to read the table

Columns A, B, C, D and E each detail a coherent strategy where country targets are relative to each other.

Column A is a world that universally adopts the distributive justice approach.

Column B is a world that universally adopts the corrective justice approach.

Column C presents the targets that each country would need to adopt to follow suit if the EU28 opted to be a leader. Under this scenario, the EU28 would set a target of 61% below 2010 levels by 2030 and other countries would fall in line, adopting either distributive or corrective justice approaches commensurate with the EU28 target.

Columns D and E present the same type of information as column C but leadership comes from China (with a 32% reduction target by 2030 on 2010 levels) and the US (with a 75% reduction target by 2030) respectively.

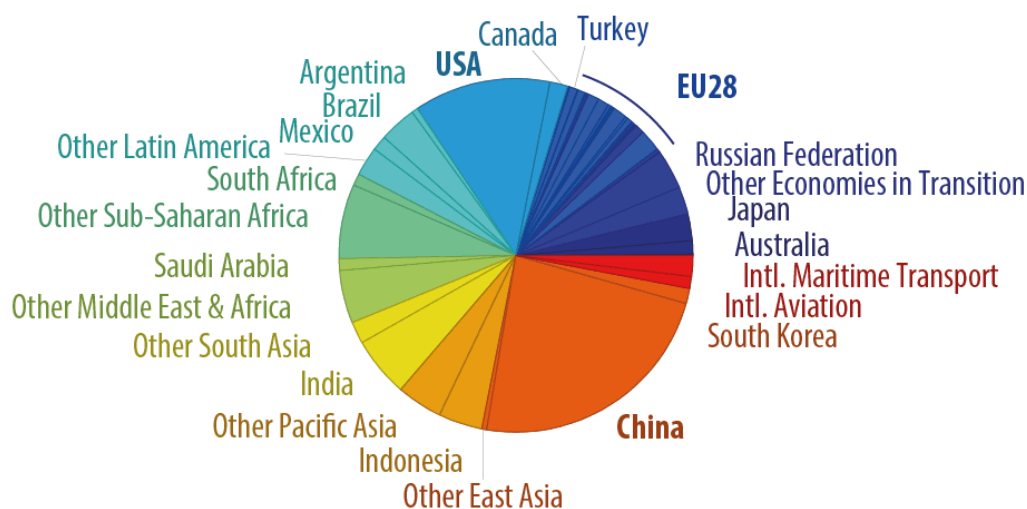
Column F should be read slightly differently. It does not present one coherent global scenario. It presents the target that each country would need to adopt to be deemed an effective diversity-aware leader. Should any of those countries become an effective leader, the targets of the other countries would be determined relative to the leader country's target.



Column		A	B	C	D	E	F
Country		Distributive justice	Corrective justice	EU28 leadership	Chinese leadership	USA leadership	Leadership targets for each country
Argentina	2025	-18%	-14%	-20%	-18%	-14%	-30%
	2030	-28%	-24%	-33%	-28%	-24%	-47%
Australia	2025	-18%	-40%	-31%	-18%	-41%	-41%
	2030	-30%	-65%	-50%	-30%	-65%	-66%
Brazil	2025	-25%	-31%	-39%	-25%	-32%	-41%
	2030	-35%	-45%	-57%	-35%	-46%	-59%
Canada	2025	-29%	-48%	-40%	-29%	-49%	-50%
	2030	-41%	-70%	-88%	-41%	-71%	-72%
China	2025	-19%	+3%	+1%	-19%	+2%	-19%
	2030	-32%	-4%	-6%	-32%	-4%	-32%
EU28	2025	-30%	-35%	-43%	-30%	-36%	-43%
	2030	-41%	-49%	-61%	-41%	-50%	-61%
India	2025	+68%	+68%	+68%	+68%	+68%	+68%
	2030	+84%	+98%	+98%	+84%	+98%	+80%
Indonesia	2025	-32%	-26%	-30%	-32%	-26%	-41%
	2030	-39%	-32%	-38%	-39%	-32%	-53%
Japan	2025	-39%	-34%	-38%	-39%	-34%	-47%
	2030	-50%	-45%	-50%	-50%	-45%	-62%
Mexico	2025	+1%	+8%	+8%	+1%	+8%	-3%
	2030	-9%	+13%	+13%	-9%	+13%	-10%
Norway	2025	-2%	-13%	-21%	-2%	-14%	-24%
	2030	-13%	-23%	-34%	-13%	-24%	-42%
Russia	2025	-35%	-53%	-47%	-35%	-54%	-55%
	2030	-48%	-73%	-65%	-48%	-74%	-76%
Saudi Arabia	2025	-11%	-21%	-26%	-11%	-21%	-29%
	2030	-22%	-38%	-46%	-22%	-39%	-51%
South Africa	2025	-21%	-22%	-30%	-21%	-23%	-35%
	2030	-33%	-37%	-48%	-33%	-38%	-54%
South Korea	2025	-44%	-36%	-38%	-44%	-36%	-48%
	2030	-54%	-43%	-47%	-54%	-44%	-60%
Switzerland	2025	-23%	-13%	-17%	-23%	-14%	-31%
	2030	-33%	-20%	-25%	-33%	-20%	-44%
Turkey	2025	+0%	+4%	+4%	+0%	+4%	-4%
	2030	-5%	+6%	+6%	-5%	+6%	-11%
USA	2025	-29%	-51%	-41%	-29%	-52%	-52%
	2030	-41%	-74%	-59%	-41%	-75%	-75%

*Table 1: G20 countries' 2025 and 2030 greenhouse gas emission allocations with respect to 2010 to bring world emissions on track with the 2°C guardrail (note: for India and Mexico the targets calculated exceed the business-as-usual reference scenario and are therefore capped at those levels, consistent with the methodology outlined in the Nature Climate Change paper<sup>1</sup>) — (See Box 2 for explanation of Table 1 and Box 1 for detail on the 2°C guardrail)*

## 2010: Global greenhouse gas emissions



## 2030: Emissions relative to 2010

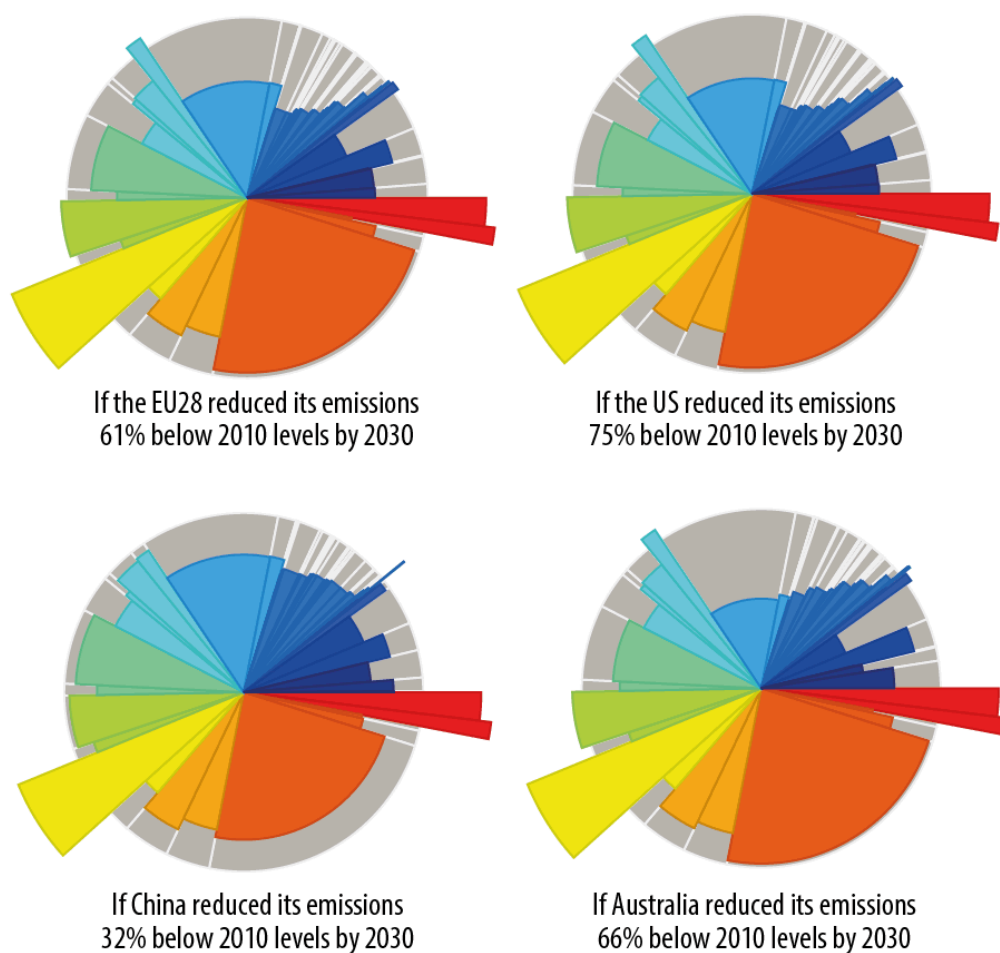


Figure 1: Relative country shares of global greenhouse gas emissions in 2010, and country allocations in 2030 (with respect to 2010 levels) under diversity-aware leadership scenarios following the EU, the US, China and Australia.

## How current pledges rate

In December 2015, countries will meet in Paris to negotiate a climate agreement to come into force in 2020. In the lead-up to this meeting each country is to determine in-house, based on its own characterisation of a fair share, what might be its adequate and acceptable emissions-reduction target post-2020. The pledges proposed by countries under this arrangement are known as 'Intended Nationally Determined Contributions', or INDCs. The idea is for INDCs to undergo international scrutiny with a view to yielding more ambitious final pledges (or NDCs) before 2020. Many countries have submitted INDCs and more will do so before the Paris meeting.

### How does the European INDC rate?

The EU was among the first to submit an INDC. It proposed a 40% reduction in its emissions by 2030 based on 1990 levels. This equates to a 27% reduction on 2010 levels.

The EU is often considered a pioneer in climate policy-making. However a comparison between the EU's INDC and all EU28 targets listed in Table 1 suggests that the proposed pledge falls short of leadership and of a fair share.

If every country followed suit with the EU's INDC, under a distributive justice approach China would adopt a -17% target for 2030 on 2010 levels and the US a -32% target. This would result in global emissions exceeding by 12% the 2030 levels required to track a 2°C guardrail. The EU28 could opt to bridge the gap between its INDC and what is required to claim leadership by contributing financial assistance to other countries. Assuming a conservative cost of \$US10 per tonne of emissions, the EU28 would need to offer \$US15 billion annually.

### How does the US INDC rate?

In its INDC, the US has proposed a 26-28% reduction on 2005 levels by 2025. This is the same as a 22-24% reduction on 2010 levels by 2025. This falls short of all the US options listed in Table 1 but comes close to the required US target under a universal distributive justice approach. However, if every other G20 country followed

suit with the INDC proposed by the US, the resulting emissions in 2025 would be 6-21% above the levels required to track the 2°C guardrail (depending on the allocation approach adopted). To bridge the gap between its INDC and leadership the US would need to make an annual contribution of \$US17-18 billion.

### How does the Russian INDC rate?

Russia has proposed an INDC that includes a commitment to reduce Russian emissions by 25-30% on 1990 levels by 2030. This is equivalent to Russia increasing its 2010 emissions by 46-56%. If every country matched the Russian INDC's relative ambition, global emissions in 2030 would exceed by 86-111% the 2°C guardrail requirements (depending on the allocation approach adopted). Russia would need to pledge annual financial assistance of \$US18-19 billion in addition to its INDC to claim leadership.

### How does the Chinese INDC rate?

In June 2015 China submitted an INDC outlining an intention to peak emissions by 2030 and reduce its emissions intensity of economic growth by 60% to 65%.<sup>2</sup> It is difficult to quantify such a target as there is no indication of the level at which emissions will peak. Based on a variety of factors (themselves highly uncertain) it is estimated that Chinese emissions may be 35% above 2010 levels in 2030. Clearly, this is insufficient when compared to all targets listed in Table 1.

### How does the Swiss INDC rate?

The Swiss INDC offers promise. Switzerland proposed a reduction in its emissions of 50% below 1990 levels by 2030. This is akin to pledging a 52% reduction on 2010 levels. From Table 1 the Swiss INDC outdoes the targets called for by all approaches and could represent leadership.<sup>3</sup>

### How does the Australian INDC rate?

Australia has submitted an INDC pledging a 26% to 28% reduction on 2005 levels by 2030.<sup>4</sup> This is equivalent to a 23% to 25% reduction on 2010 levels.

The Australian INDC falls well short of the targets called for under all approaches, even a distributive justice

	INDC (announced)	INDC (on 2010 levels)	Distributive justice	Corrective justice	Leadership
US (2025)	-26 to -28% (on 2005 levels)	-22 to -24%	-29%	-51%	-52%
EU (2030)	-40% (on 1990 levels)	-27%	-41%	-49%	-61%
China (2030)	Peak by 2030	+35% (estimate)	-32%	-4%	-32%
Australia (2030)	-26 to -28% (on 2005 levels)	-23 to -25%	-30%	-65%	-66%

Table 2: Targets pledged in INDCs and targets required under fair share and leadership approaches for the US, the EU, China and Australia.

approach, where Australia's relatively low population provides an advantage.

To show leadership Australia would need to triple its current target. However, even to do just its fair share, Australia would need to more than double (and almost triple) its contribution under a corrective justice approach.

The Climate Change Authority, in its review of Australia's emissions-reduction goals, recommended a target of -40% to -60% by 2030 on 2000 levels.<sup>5</sup> This is equivalent to a target of 41% to 61% on 2010 levels. The lower end of that target is more than sufficient for Australia to do its fair share under a distributive justice approach. However, even the upper end of the Climate Change Authority's target range is insufficient for Australia to do its fair share under a corrective justice approach. Neither does it put Australia in a leadership position.

Table 2 presents for the US, the EU, China and Australia the targets announced in INDCs and the targets required for each country to do its fair share or to claim leadership.

## Conclusion

The December 2015 conference in Paris aims to be a first-pass at setting national targets post-2020. As they currently stand, national pledges proposed by countries are insufficient for a likely chance of keeping the world safely within the 2°C guardrail.

Most countries are not proposing enough to cover even their fair share of the global effort required. The US, EU and China would need to double their targets to do their fair share and to even come close to qualifying as leaders. Only Switzerland, through its proposed INDC, shows potential climate action leadership.

For Australia, leadership would require a tripling of the current target. Similar efforts would be required of Australia to be a good global citizen and follow suit with either the US or the EU should one of them show bold leadership. Interestingly, should China show such leadership, Australia would need a relatively small increase in its target for it to be commensurate.



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Briefing Paper 2  
October 2015

Published by the  
University of Melbourne

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