

## **Is the Paris Agreement on climate change truly revolutionary?**

Since the Industrial Revolution, humanity has emitted carbon dioxide (CO<sub>2</sub>) and other heat trapping greenhouse gases (GHGs) through fossil fuel burning and other economic activities, warming the Earth's surface. If emissions continue unabated, global temperature will rise 5°C by 2100, when (ironically) some Middle Eastern cities will reach summer maximum temperatures that are lethal to fit human bodies,<sup>1</sup> followed by further warming and sea level rise of over 13 metres by 2500.<sup>2</sup> By the late 1980s many scientists and policymakers called for a global treaty to address the issue, and official talks began in 1991.<sup>3</sup> Since the United Nations Convention on Climate Change (UNFCCC) came into force in 1995, the world's governments have met annually with the aim of preventing "dangerous anthropogenic interference with the climate system".<sup>4</sup> The appropriate measure of a climate agreement's success is not whether it advances the diplomatic negotiating process, but whether it actually addresses this issue. The Convention's 21<sup>st</sup> annual Conference of the Parties (COP21) resulted in the Paris Agreement, which this essay will critically examine to assess its potential to solve the climate crisis.

The rhetoric of those who made the Agreement sets a high bar. French President Francois Hollande proclaimed: "In Paris, there have been many revolutions over the centuries. Today it is the most beautiful and the most peaceful revolution that has just been accomplished—a revolution for climate change."<sup>5</sup> However, such grand claims are not new. For example, at COP17 in Durban in 2011, which achieved only an agreement to make an agreement in Paris, chair Maite Nkoana-Mashabane said they "save[d] one planet for the future of our children and our grandchildren to come".<sup>6</sup> Every year politicians have misleadingly claimed the talks were making progress, yet greenhouse gas emissions and concentrations have continued to skyrocket. Is Paris any different?

I will argue the Paris Agreement is too little, too late, and far from revolutionary. I will begin by outlining the state of the climate crisis as context for what the Paris Agreement

allegedly addresses. I will then consider the feasibility of the Agreement's stated temperature targets, and explain how the Agreement relies on future technologies to remove carbon from the atmosphere rather than any concrete plan to address the economic causes of GHG emissions. I will also contrast the Agreement with other actions simultaneously being taken by governments. I will then examine various technical elements of the Agreement: nationally determined contributions, ratification, legal form, stocktakes, emissions trading, and the work program for 2016-2020. Finally, I will consider whether the existence of the Paris Agreement will in itself inspire action from governments and/or businesses, and briefly discuss some potentially positive developments.

The Paris Agreement is allegedly a major step toward achieving the UNFCCC objective of preventing dangerous climate interference. The first problem with this is that in the 25 years that politicians have been talking, human-caused global warming has already reached a dangerous level. In 2015, atmospheric CO<sub>2</sub> reached 400 ppm,<sup>7</sup> the highest level in around 15 million years,<sup>8</sup> and global temperature exceeded 1°C above preindustrial,<sup>9</sup> around the warmest in 10,000 years.<sup>10</sup> 2016 is on track to be even hotter, with February hitting a record-smashing 1.95°C above preindustrial.<sup>11</sup> The rate at which human activity is changing the Earth's climate is without precedent since the mass extinction of the dinosaurs.<sup>12</sup> We are already experiencing increasing extreme weather costing human lives and record-drought-driven war in Syria.<sup>13</sup> Worse, we are already passing several tipping points which will amplify carbon emissions and warming, and flood island nations and agricultural river deltas.<sup>14</sup> An increasing number of the world's top climate experts are warning we are in a climate emergency.<sup>15</sup> Yet humanity continues to increase global GHG emissions in line with the worst-case scenario (except for a to-be-confirmed 0.6% decrease in 2015 due to Chinese action).<sup>16</sup>

This is the context in which the Paris Agreement must be considered. The Agreement claims to be implementing the UNFCCC objective by limiting warming to "well below 2 °C

above pre-industrial levels”.<sup>17</sup> An extra clause on “pursuing efforts to limit the temperature increase to 1.5 °C”<sup>18</sup> was won by a “High Ambition Coalition”,<sup>19</sup> including Malcolm Turnbull who has trumpeted this as evidence of Australia’s alleged climate leadership.<sup>20</sup> Unfortunately, with today’s 1°C warming already dangerous, 1.5-2°C is far from safe, as has been admitted by a UNFCCC Secretariat report.<sup>21</sup> For example, 1.5°C will destroy most coral reefs which are a source of food and coastal protection for many tropical countries,<sup>22</sup> and 2°C could bring near-worst-case impacts on freshwater and damage many staple crops.<sup>23</sup> Worse, there is mounting evidence that just over the present global temperature (ie. below 1.5°C) lie yet more tipping points, for ice melt and ocean acidification, and 2°C could trigger runaway ice sheet collapse raising sea level several metres by 2100.<sup>24</sup> Impacts below 2°C are expected to hit the poorest countries hardest.<sup>25</sup>

Safe or not, keeping warming below 1.5-2°C will be very difficult to achieve at this late stage, but the Agreement indicates little engagement with this difficulty. Though surface temperature has so far only risen 1°C, there is accumulated heat still working its way through the oceans, and more heating masked by particulate air pollution also from fossil fuels, which will clear when we inevitably phase them out to stop CO<sub>2</sub> emissions.<sup>26</sup> In other words, past inaction has already locked in roughly the 1.5-2°C warming that the Paris Agreement says it will prevent. This hidden future warming means preventing 2°C is now probably unachievable without emergency-scale emissions cuts, and preventing 1.5°C is probably unachievable without unproven carbon removal technologies. The Agreement’s preamble contains lip service such as “*recognizing* that climate change represents an urgent and potentially irreversible threat to human societies” and “*emphasizing* the need for urgency in addressing climate change”.<sup>27</sup> Yet at odds with this urgency, the body of the Agreement doesn’t even specify a date for peak global GHG emissions. It merely says emissions should peak “as soon as possible”, with a later peak for developing country emissions, then sketches for the second

half of the century a target of balancing GHG emissions sources and sinks.<sup>28</sup> The gap between the stated ambition and the proposed actions is farcical.

Governments are placing pressure on scientific advisors to come up with ever more unlikely pathways to extend the timeline for preventing 2°C, and most comply for fear of being branded alarmist instead of calling out the failure of the political process.<sup>29</sup> In return for their reluctant pragmatism, scientists are finding politicians ignore the increasingly unfeasible fine print in favour of rhetoric that there is still time to act cheaply. IPCC scenarios which allow global emissions to peak in 2030 assume subsequent global emissions reductions of 6%/year, faster than the planned economic growth rate, followed by significant carbon removal.<sup>30</sup> Many scenarios also assume a global carbon tax began in 2010.<sup>31</sup> Furthermore, these scenarios still involve a 33% risk of exceeding 2°C if the climate proves more sensitive than mid-range projections. Indeed, we have already burned enough carbon for a more than 10% risk of 2°C.<sup>32</sup> This contrasts with the field of engineering, where it is considered best practice to design for a less than 0.001% chance of failure when lives are at stake.<sup>33</sup> Risk should not be taken lightly because scientists are biased not toward alarmism but toward reticence, and also for mathematical reasons impacts are more likely to be at the extreme high end of projections than at the extreme low end.

There are no mainstream model scenarios in which global temperature never exceeds 1.5°C, so the Paris 1.5°C goal is essentially an aspiration to quickly reverse inevitable warming.<sup>34</sup> A 1.5°C scenario assumes global energy demand barely increases throughout the century, and massive carbon removal in the second half of the century.<sup>35</sup> The assumption of carbon removal relies on geoengineering technologies which are not yet available, involve risks that are not fully understood, and raise ethical concerns for environmentalists.<sup>36</sup> The option currently being assumed in 1.5°C scenarios, biomass energy with carbon capture and storage (BECCS), is limited in scale because it requires vast areas of land (1-3 times the size of India)

in a world where it is increasingly difficult to grow enough food.<sup>37</sup> Worse, the implicit assumption that it will always be possible to get back to net zero emissions ignores that global warming is already starting to turn some natural carbon sinks into amplifying feedbacks, and these feedbacks will become a major factor before 2°C.<sup>38</sup> So future carbon removal can only work if it complements emissions cuts today.

To truly stabilize global temperature below a dangerous level would require halting the warming at around the current level and *cooling* the planet to reverse the tipping points we have already passed. If this is even possible, it would involve more drastic action than the 1.5-2°C scenarios. The only detailed such scenario is the “One Degree War Plan”, which proposes willing major emitters go into a wartime-scale emergency action mode before 2020, halving global emissions in 5 years at an estimated cost of 5-10% of annual GDP. Proposed actions toward this target include closing the world’s 1000 dirtiest coal plants, rationing electricity, halving deforestation, building solar and wind farms in deserts, recycling all waste, and so on. The plan does not specify how it would offset the warming effect of clearing air pollution, though this would presumably be done through dramatic cuts in emissions of short-lived greenhouse gases like methane. To avoid the heat currently working through the oceans, the emissions cuts would also need to be accompanied by risky attempts at geoengineering, including near-term measures to directly reflect sunlight as well as long-term carbon removal.<sup>39</sup> Only this scale of action can prevent amplifying feedbacks that could take us beyond the intended temperature limit. While the scientific feasibility of stopping and reversing the past warming is questionable, this gives some idea of the scale of action now required to actually achieve the UNFCCC objective.

Yet the Paris Agreement contains no concrete plan to reach its grand targets, indeed no discussion of the fundamental economic causes driving global warming. It does not even mention the words “coal”, “oil”, “natural gas”, or “fracking”.<sup>40</sup> It includes no guidance on

specific sectors, exports and imports, corporations, consumption, population, GDP growth, or economic systems.<sup>41</sup> Meanwhile, governments continue to announce fossil fuel expansion plans. Since Paris, India has announced it will double coal production, and the UK has approved fracking under national parks.<sup>42</sup> The world still plans to construct 2,440 *new* coal power plants<sup>43</sup>, the US is pushing for oil drilling in the Arctic,<sup>44</sup> and beef exporters are pressuring China and India to switch to a more meat-intensive (and therefore carbon-intensive) diet.<sup>45</sup> Far from a global carbon tax, governments still subsidize fossil fuel industries to the tune of \$500 billion.<sup>46</sup> Many countries recently signed the Trans-Pacific Partnership, containing an investor-state dispute settlement mechanism that could be used to protect fossil fuel profits from climate policies; its environmental safeguards don't mention climate.<sup>47</sup> Two days after the Agreement, Queensland Premier Annastacia Palaszczuk stated: "We will always be reliant on coal."<sup>48</sup> It's hard not to conclude that either governments are being two-faced, or the right hand doesn't know what the left hand is doing.

Instead of a blueprint for transforming economies, the Agreement merely compiles (mostly pre-existing) national pledges to cut emissions in the abstract, and relies on each of the individual 196 countries to meet their own target with their own policies. Pledges are now given the fancy title of "nationally determined contributions" (NDCs). The first problem is that these NDCs exclude aviation and shipping because UNFCCC accounting considers no one nation to be responsible for them.<sup>49</sup> Because each government decided its own NDC they are not formulated in easily comparable terms (eg. differing baseline years), cause for suspicion that many countries may be fudging the numbers.<sup>50</sup> Some NDCs are for 2025, others for 2030. The 2030 timeframe is too distant for both political and physical reasons. Politically, emissions targets should be set only a few years in the future so politicians will be held accountable for them within one election cycle. Physically, we need substantial emissions cuts within years, not decades. Even assuming all the NDCs are achieved, global emissions will still *rise* 10-20%

by 2030.<sup>51</sup> Little better than pre-Paris pledges, they put us on a pathway to around 3°C warming by 2100, 3.5°C if emissions reduction stops in 2030, and even higher if the NDCs are not achieved or the climate is more sensitive than mid-range projections.<sup>52</sup> 3°C is far beyond the climate range experienced by the human species and 4°C is likely beyond the ability of global civilization to adapt.<sup>53</sup> In short, the Paris NDCs are too little, too late.

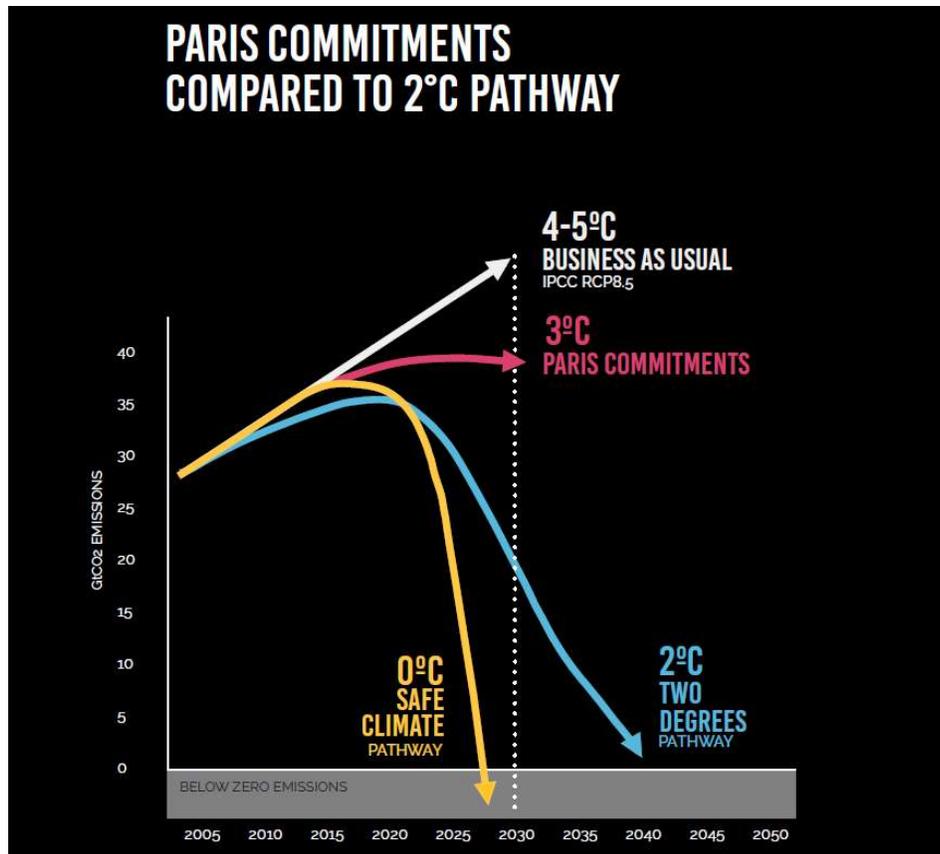


Figure 1: Rough comparison of Paris commitments with business as usual, a two degree pathway, and a safe climate pathway.<sup>54</sup>

The Paris Agreement will not come into force until 2020,<sup>55</sup> and then only if ratified by at least 55% of the 196 parties, and moreover that 55% must represent at least 55% of global emissions.<sup>56</sup> Though almost all parties have signed the Agreement, so far only 17 have ratified.<sup>57</sup> The US, which accounts for 18% of emissions, never ratified the Agreement's predecessor the Kyoto Protocol, and denier presidential candidate Donald Trump has

threatened to “renegotiate”<sup>58</sup> or “cancel”<sup>59</sup> the Paris Agreement if he wins. So the Paris Agreement contains no binding requirement for countries to do *anything* for at least the next five years.

Even after the Agreement finally comes into effect its NDCs will be non-binding,<sup>60</sup> a betrayal of the promise made in the 2011 Durban Platform. This is because at the last minute the US threatened to pull out unless the word “shall” was diluted to “should” in Article 4.4, so the Agreement would not have to be approved by the Republican-dominated Congress.<sup>61</sup> Instead of being required to implement their NDCs, governments must merely “pursue” domestic policies with the “aim” of achieving them.<sup>62</sup> Even those clauses which are legally “binding” are in reality unenforceable (like almost all international law).<sup>63</sup> Already Australia’s attempt to suppress a report on the Great Barrier Reef<sup>64</sup> has violated Article 12: “Parties shall cooperate in taking measures, as appropriate to enhance climate change education, training, public awareness, public participation and public access to information”.<sup>65</sup> There are plans for a compliance mechanism, but it will be “non-adversarial and non-punitive”.<sup>66</sup> Just as Canada pulled out of the Kyoto Protocol after massively increasing its emissions, any country may withdraw from the Paris Agreement without sanction from 2024, in other words before they must meet any targets.<sup>67</sup> The very reason the Paris decision is called an “Agreement” rather than a “Protocol” is because negotiators could not agree on its legal character.<sup>68</sup> So the Paris Agreement contains no binding requirement to cut emissions, rendering it little more than a catalogue advertising governments’ emissions targets.

One thing that is “binding” is a requirement for each country to submit a new NDC every 5 years,<sup>69</sup> limiting emissions to a lower level each time.<sup>70</sup> Additionally, the High Ambition Coalition secured<sup>71</sup> a parallel 5-year cycle of international stocktakes to determine whether NDCs are collectively progressing toward the Agreement goal.<sup>72</sup> Saudi Arabia and India argued for a 10-year cycle,<sup>73</sup> and effectively got their way in the sense that participation in this process

won't become mandatory until the Agreement comes into force. Astoundingly, therefore, the first mandatory stocktake won't take place until at least 2023,<sup>74</sup> and the first mandatory NDC submission process not until at least 2025 (albeit with an informal stocktake in 2018 and informal NDC submissions in 2020).<sup>75</sup> Presenting as “high ambition” a 5-year review process beginning 8 years away is a joke for two reasons. Firstly, it is several election cycles away and thus unlikely to place much pressure on politicians. Secondly, warming in the pipeline has already blown past the 1.5°C temperature limit demanded by the same High Ambition Coalition, and by the time the stocktake rolls around it will be even more impossible to meet this target it is supposed to help move toward!

Article 6 establishes a new mechanism through which countries may choose to engage in international emissions trading, euphemistically described as “internationally transferred mitigation outcomes”.<sup>76</sup> This is highly concerning because of the spectacular failure of emissions trading to date. Initially advocated only by notorious climate saboteurs such as the US and Australia, emissions trading was eventually adopted as the climate policy instrument of choice across the developed world and China.<sup>77</sup> One of the main flaws in the Kyoto Protocol was an offsets mechanism allowing developed countries to continue growing their emissions, while paying developing countries to take actions that may have happened anyway.<sup>78</sup> To be fair, offsets might be less open to rorting now that all countries have the same emissions reporting obligations and more countries are moving toward absolute emissions reductions. The Paris Agreement insists the trading mechanism must “ensure environmental integrity and transparency” and “apply robust accounting [for] avoidance of double counting”<sup>79</sup>; it remains to be seen how faithfully these words will be fulfilled. But even without outright fraud, emissions trading is designed not to cut emissions but to prioritize allegedly least-cost ways of doing so. And in a fossil fuel economy, the “least-cost” actions are likely to be ones that don't initiate any fundamental long-term structural change (for example, it may appear cheap to

switch from coal to gas or from brown coal to black coal, when in reality we urgently need to phase out fossil fuels altogether).<sup>80</sup>

The Paris Agreement is attached to a work program to ramp up action prior to 2020. This would have to be pretty impressive to justify delaying the stocktake to 2023, but it is not. For example, it urges all countries to ratify and implement commitments they made years ago, including otherwise forgotten parallel-to-Paris negotiations to ramp up action pre-2020.<sup>81</sup> It merely encourages them to voluntarily cancel surplus emissions permits from the Kyoto Protocol.<sup>82</sup> It organizes an annual meeting to give countries an opportunity to announce stronger targets.<sup>83</sup> The decision also established a non-state action registry which already includes pledges from 5000 companies,<sup>84</sup> but it is unclear how transparent non-state-actors will have to be, so the registry risks just showcasing corporate greenwash. The only “binding” requirement to do anything before 2020 is for the few countries remaining in the Kyoto Protocol to implement the weak targets they set themselves in 2012. Even the Kyoto targets are not yet binding because they await ratification by 79 more countries; only 8 of the 37 countries still bound by Kyoto have ratified.<sup>85</sup>

Defenders of the Paris Agreement claim the very existence of a global climate agreement will create enough confidence to drive further action from governments and corporations.<sup>86</sup> Let’s take governments first. A set of bottom-up voluntary national pledges subject to review is a starting point for deepening international cooperation over time, the argument goes, because a similar approach worked for the international trade regime.<sup>87</sup> Now every country has agreed to make a contribution, governments can no longer excuse inaction on the basis of waiting for others to join them. This is valid insofar as it is an argument for each country to act unilaterally rather than wait for climate talks to agree on a top-down division of responsibilities, but inadequate as a reassurance that climate talks are on track. Pledge-and-review may be a good idea in principle, but time is now too short to wait another eight years to deepen

cooperation. Governments can still defend inadequate climate policies using the excuse that they will meet their Paris commitments, and the Agreement has not deterred Trump from claiming China won't meet its target.<sup>88</sup> The trade analogy fails for at least two reasons. Firstly, what worked for trade may not work for climate, because the trade regime is in line with politicians' current priorities of increasing growth and corporate power, whereas climate action conflicts with those priorities. Secondly, trade negotiations have dragged on for seven decades, and in the last two decades have run into a divide between rich and poor countries much like the climate talks. The urgency of the climate crisis requires much more rapid progress.

The other half of the confidence argument is that Paris sent an investment signal to corporations. Unfortunately, the Paris targets are too far off to send a very strong signal. Modest targets 10-15 years from now and a global emissions peak around 2030 are not going to drive the necessary rapid phaseout of fossil fuels. Investors can still gamble that politicians are bluffing when they claim to be aiming for net zero emissions sometime between 35 and 85 years away. Even if that distant target is implemented, they have a good chance of getting several decades' worth of profits out of fossil fuel infrastructure. One post-Paris business briefing concluded "the Agreement could herald a significant shift to a low carbon future over the coming decades".<sup>89</sup> But the takeaway from an effective deal would have been: the Agreement *will* herald a *radical* shift to a low carbon future over the coming *years*, and a *zero* carbon future as soon as possible. Most of all, the claim that Paris sent an investment signal is demonstrably false. Though fossil fuel stockmarket prices are down somewhat, that is because so many new reserves have been opened up, rather than the devaluing of reserves worth tens of trillions of dollars that should have occurred if Paris had truly signalled they would be left in the ground.<sup>90 91</sup>

Perhaps one reason why world leaders have talked up the Paris Agreement is in the hope of prompting corporate change by merely pretending their measly agreement makes it

inevitable. If so, they are deluding themselves. It is irrational to rely on the free market to realize decarbonization is necessary. A climate policy cannot be made to work simply by saying it will. Investors cannot be confident in any climate policy as long as there are opposing political forces seeking to undermine those policies. And there is still a powerful fossil fuel lobby funding both those politicians who claim to be taking tentative steps toward climate action, and those like Trump who openly oppose all climate policies. As Australia has learned, not even taxes are certain in climate policy.

Another point which appears deceptively optimistic is that since the ill-fated Copenhagen conference of 2009 we have seen significant increases in the amount and scale of climate policies, viability of zero-carbon technologies, and acceptance of the science proving a need for action. Firstly, these developments are largely due to factors outside the UN process, such as the campaign against the Keystone XL oil pipeline,<sup>92</sup> the fossil fuel divestment plaguing Australian coal export plans,<sup>93</sup> renewable energy deployment policies, China's reorientation toward slower growth and capping coal use,<sup>94</sup> and the 2014 US-China deal.<sup>95</sup> Even the NDCs were announced in the two years leading up to Paris; there was no attempt to negotiate more ambitious targets at Paris itself.<sup>96</sup> More importantly, while all these actions would have been very welcome a decade or two ago, they do not remotely add up to the emergency-scale response required now.

Were there any positives that came out of Paris? Yes. Article 4.11 states a country may at any time unilaterally strengthen its NDC – that at least is sensible.<sup>97</sup> Paris was the first time that *all* countries have promised to undertake some form of climate action, and to report on their emissions and policies in a transparent way.<sup>98</sup> If the latter is implemented correctly, it will provide an objective basis on which to shame countries who fail to keep their promises.<sup>99</sup> The plan to ramp up action through periodic NDCs and stocktakes is not bad in principle, though would be much better if it was scheduled every one or two years rather than every five years.

And negotiators seemed more cooperative than at some previous summits.<sup>100</sup> So yes, there were some small steps forward, but they are hardly revolutionary. The best that can be said about the Paris Agreement is that it is a slight improvement on what little was achieved in the previous quarter-century of climate talks.

In conclusion, the Paris Agreement is a fractal failure – a failure on all levels. It aims to prevent dangerous warming with a limit of 1.5-2°C, when past inaction has already brought warming to a dangerous 1°C which might only be reversible through unproven geoengineering technology. Instead of meeting its too-risky temperature target through immediate action, it banks on future geoengineering which becomes ever more unfeasible as greenhouse gases rise, and a sketchy emissions pathway which allows a significant chance of overshooting 2°C. Instead of aligning national actions with that dubious pathway, it lets countries set their own emissions targets allowing global emissions to rise until 2030, putting the Earth on track to 3°C plus. Instead of standardizing those inadequate targets, it allows countries to define their own baselines. Instead of planning how to transform the economy to meet these ill-defined targets, the Agreement ignores coexisting plans for fossil fuel expansion and allows emissions trading to limit costs to the fossil fuel economy. Instead of enforcing those unplanned actions, it makes them non-binding with no penalties for non-compliance. Instead of this inadequate Agreement being implemented and its flaws fixed as soon as possible, it won't come into force until 2020 and will take a decade to complete its first formal review. And instead of admitting the Agreement's inadequacy, politicians are talking it up.

The implications of the Paris failure are wide-ranging. If we rely on the Paris Agreement, we are headed for runaway global warming with unpredictable consequences. It's telling that the only sources I found who welcomed the Agreement were those close to the political process, who delude themselves that merely concluding talks means they have achieved something. Independent scientists and academics were scathing in their condemnation of politicians for

failing to respond to the crisis in a timely manner. Academics have a responsibility to communicate their understanding to the broader public to expose the political spin for the unworkable procrastination that it is. Meanwhile politicians, and the voters who elect them, must know they cannot rely on the climate talks to solve global warming. Governments must act unilaterally to introduce enforceable policies, rather than aspirational targets and market mechanisms whose success depends on investor confidence. The politicians who sold the Paris Agreement as “revolutionary” will be remembered as the politicians who pretended to save the planet.

## Endnotes

- <sup>1</sup> Pal, JS & Eltahir, EAB, 2015, 'Future temperature in southwest Asia projected to exceed a threshold for human adaptability', *Nature Climate Change*, 26 October, retrieved 29 May 2016, <http://eltahir.mit.edu/wp-content/uploads/2015/08/Paper.pdf>
- <sup>2</sup> Dennis, B & Mooney, C, 2016, 'Antarctic ice loss could double expected sea level rise by 2100, scientists say', *The Age*, 31 March, retrieved 29 May 2016, <http://www.theage.com.au/environment/climate-change/antarctic-ice-loss-could-double-expected-sea-level-rise-by-2100-scientists-say-20160330-gnumtj>
- <sup>3</sup> Weart, S, 2016, 'International Cooperation' in *The Discovery of Global Warming*, American Institute of Physics, retrieved 30 May 2016, [http://www.aip.org/history/climate/internat.htm#L\\_M003](http://www.aip.org/history/climate/internat.htm#L_M003)
- <sup>4</sup> *ibid.*, [https://www.aip.org/history/climate/internat.htm#L\\_M060](https://www.aip.org/history/climate/internat.htm#L_M060)
- <sup>5</sup> Center for Climate and Energy Solutions, 2015, *Outcomes of the U.N. Climate Change Conference in Paris*.
- <sup>6</sup> Black, R, 2011, 'UN climate talks end with late deal', *BBC News*, 11 December, retrieved 29 May 2016, <http://www.bbc.co.uk/news/science-environment-16124670>
- <sup>7</sup> Slezak, M, 2016, 'World's carbon dioxide concentration teetering on the point of no return', *Guardian*, 11 May, retrieved 29 May 2016, <http://www.theguardian.com/environment/2016/may/11/worlds-carbon-dioxide-concentration-teetering-on-the-point-of-no-return>
- <sup>8</sup> Spratt, D, 2016, *Climate reality check: After Paris, counting the cost*, Breakthrough National Centre for Climate Restoration, Melbourne, Australia, p. 10.
- <sup>9</sup> Spratt, D, 2015, 'As 2015 smashes temperature records, it's hotter than you think', *Climate Code Red*, 24 August, retrieved 30 May 2016, <http://www.climatecodered.org/2015/08/as-2015-smashes-temperature-records-its.html>
- <sup>10</sup> Rahmstorf, S, 2013, 'Paleoclimate: The end of the Holocene', *RealClimate*, 16 September, retrieved 29 May 2016, <http://www.realclimate.org/index.php/archives/2013/09/paleoclimate-the-end-of-the-holocene>
- <sup>11</sup> Spratt, D, 2016, 'Mind-blowing February 2016 temperature spike a "climate emergency" says scientist, as extreme events hit Vietnam, Fiji and Zimbabwe', *Climate Code Red*, 14 March, retrieved 30 May 2016, <http://www.climatecodered.org/2016/03/mind-blowing-february-2016-temperature.html>
- <sup>12</sup> Lee, H, 2016, 'Onset of Eocene warming event took 3-4 millennia (so what we're doing is unprecedented in 66 million years)', *Skeptical Science*, 11 February, retrieved 29 May 2016, [http://www.skepticalscience.com/onset\\_of\\_PETM\\_took\\_3-4\\_millennia.html](http://www.skepticalscience.com/onset_of_PETM_took_3-4_millennia.html)
- <sup>13</sup> Spratt, D, 2016, *Climate reality check*, p. 8.
- <sup>14</sup> *ibid.*
- <sup>15</sup> Readfearn, G, 2016, 'Welcome to the climate emergency: you're about 20 years late', *Guardian*, 18 March, retrieved 30 May 2016, <http://www.theguardian.com/environment/planet-oz/2016/mar/18/welcome-to-the-climate-emergency-youre-about-20-years-late>
- <sup>16</sup> Le Quéré, C, R Moriarty, RM Andrew, JG Canadell, S Sitch, JI Korsbakken, P Friedlingstein, GP Peters, RJ Andres, TA Boden, RA Houghton, JI House, RF Keeling, P Tans, A Arneeth, DCE Bakker, L Barbero, L Bopp, J Chang, F Chevallier, LP Chini, P Ciais, M Fader, R Feely, T Gkritzalis, I Harris, J Hauck, T Ilyina, AK Jain, E Kato, V Kitidis, K Klein Goldewijk, C Koven, P Landschützer, SK Lauvset, N Lefèvre, A Lenton, ID Lima, N Metzl, F Millero, DR Munro, A Murata, JEMS Nabel, S Nakaoka, Y Nojiri, K O'Brien, A Olsen, T Ono, FF Pérez, B Pfeil, D Pierrot, B Poulter, G Rehder, C Rödenbeck, S Saito, U Schuster, J Schwinger, R Séférian, T Steinhoff, BD Stocker, AJ Sutton, T Takahashi, B Tilbrook, IT van der Laan-Luijkx, GR van der Werf, S van Heuven, D Vandemark, N Viovy, A Wiltshire, S Zaehle, and N Zeng, 2015, 'Global Carbon Budget 2015', *Earth System Science Data*, DOI:10.5194/essd-7-349-2015, <http://www.earth-syst-sci-data.net/7/349/2015/essd-7-349-2015.html>
- <sup>17</sup> United Nations Framework Convention on Climate Change (UNFCCC), 2015, *Paris Agreement in Report of the Conference of the Parties on its twenty-first session, held in Paris from 30 November to 13 December 2015, Addendum Part two: Action taken by the Conference of the Parties at its twenty-first session*, Article 2.1(a).
- <sup>18</sup> UNFCCC, 2015, Article 2.1(a).
- <sup>19</sup> Center for Climate and Energy Solutions, 2015, *Outcomes*.
- <sup>20</sup> Parkinson, G, 2015, 'Australia open to 1.5C climate target, "carbon neutral" in 2050', *Renew Economy*, 17 November, retrieved 30 May 2016, <http://reneweconomy.com.au/2015/australia-open-to-1-5-c-climate-target-carbon-neutral-in-2050>
- <sup>21</sup> Climate Analytics, undated, *How hot is too hot*, retrieved 30 May 2016, <http://climateanalytics.org/hot-topics/how-hot-is-too-hot.html>

- <sup>22</sup> Donner, S, 2015, 'Why we need the next-to-impossible 1.5°C temperature target', *Guardian*, 30 December, retrieved 30 May 2016, <http://www.theguardian.com/environment/climate-consensus-97-per-cent/2015/dec/30/why-we-need-the-next-to-impossible-15c-temperature-target>
- <sup>23</sup> Spratt, D, 2016, *Climate reality check*, p. 9.
- <sup>24</sup> Spratt, D, 2016, *Climate reality check*, pp. 8-9.
- <sup>25</sup> Goering, L, 2015, 'Limiting global warming to 2 degrees "inadequate", scientists say', *Reuters*, 1 May, retrieved 30 May 2016, <http://www.reuters.com/article/us-climatechange-temperature-idUSKBN0NM40820150501>
- <sup>26</sup> Spratt, D, 2016, *Climate reality check*, p. 2.
- <sup>27</sup> UNFCCC, 2015, *Paris Agreement*, p. 21.
- <sup>28</sup> *ibid.*, Article 4.1.
- <sup>29</sup> Geden, O, 2015, 'Climate advisers must maintain integrity', *Nature*, vol. 521, 7 May, 27-28, p. 28.
- <sup>30</sup> *ibid.*, p. 28.
- <sup>31</sup> Roberts, D, 2015, 'The awful truth about climate no one wants to admit', *Vox*, 15 May, retrieved 30 May 2016, <http://www.vox.com/2015/5/15/8612113/truth-climate-change>
- <sup>32</sup> Spratt, D, 2016, *Climate reality check*, p. 5.
- <sup>33</sup> Sutton, P, 2015, *Striking targets: Matching climate goals with climate reality*, Breakthrough National Centre for Climate Restoration, Melbourne, Australia, p. 2.
- <sup>34</sup> Evans, S, 2015, 'Limiting global warming to 1.5C is still possible, say scientists', *Carbon Brief*, 21 May, retrieved 29 May 2016, <http://www.carbonbrief.org/limiting-global-warming-to-1-5c-is-still-possible-say-scientists>
- <sup>35</sup> *ibid.*
- <sup>36</sup> Spratt, D, 2016, *Climate reality check*, p. 4.
- <sup>37</sup> Anderson, K, 2015, 'Talks in the city of light generate more heat', *Nature*, vol. 528, 437.
- <sup>38</sup> Spratt, D, 2016, *Climate reality check*, p. 6.
- <sup>39</sup> Randers, J & P Gilding, 2010, 'The One Degree War Plan', *Journal of Global Responsibility*, vol. 1, no. 1, pp. 170-188, <http://www.emeraldinsight.com/doi/abs/10.1108/20412561011039762>
- <sup>40</sup> Spash, C, 2016, 'This changes nothing: The Paris Agreement to ignore reality', *Globalizations*, DOI: 10.1080/14747731.2016.1161119, p. 4.
- <sup>41</sup> Morgan, J, 2016, 'Paris COP 21: Power that speaks the truth?', *Globalizations*, DOI: 10.1080/14747731.2016.1163863, pp. 4-5.
- <sup>42</sup> Buxton, N, 'COP 21 charades: Spin, lies and real hope in Paris', *Globalizations*, DOI: 10.1080/14747731.2016.1161936, p. 2.
- <sup>43</sup> Clemenson, R, 2016, 'The two sides of the Paris Climate Agreement: Dismal failure or historic breakthrough?', *Journal of Environment & Development*, vol. 25(1), 3-24, p. 12.
- <sup>44</sup> Meyer, R, 2016, 'Will any oil company ever drill in the Arctic?', *The Atlantic*, 17 March, <http://www.theatlantic.com/technology/archive/2016/03/will-any-oil-company-ever-drill-in-the-arctic/474234/>
- <sup>45</sup> Clemenson, R, 2016, 'The two sides'.
- <sup>46</sup> *ibid.*
- <sup>47</sup> Jeffries, E, 2016, 'Freeing fossil fuels', *Nature Climate Change*, vol. 6, February, 125-126.
- <sup>48</sup> Peterson, D, 2015, 'Premier Annastacia Palaszczuk confirms boost in Queensland's renewable energy target', *International Business Times*, 14 December, retrieved 30 May 2016, <http://www.ibtimes.com.au/premier-annastacia-palaszczuk-confirms-boost-queenslands-renewable-energy-target-1492282>
- <sup>49</sup> Reyes, O, 2015, 'Seven wrinkles in the Paris climate deal', *Foreign Policy in Focus*, 14 December, retrieved 29 May 2016, <http://fpif.org/seven-wrinkles-paris-climate-deal/>
- <sup>50</sup> Saveresi, A, 2016, 'The Paris Agreement: a new beginning?', *Journal of Energy & Natural Resources Law*, vol. 34(1), 16-26.
- <sup>51</sup> McKie, R, 2015, 'World will pass crucial 2C warming limit, experts warn', *Guardian*, 11 October, retrieved 29 May 2016, <http://www.theguardian.com/environment/2015/oct/10/climate-2c-global-warming-target-fail>
- <sup>52</sup> 'Scoreboard Science and Data' in *Climate Scoreboard*, 2016, Climate Interactive, retrieved 30 May 2016, <https://www.climateinteractive.org/programs/scoreboard/scoreboard-science-and-data/>
- <sup>53</sup> Spratt, D, 2016, *Climate reality check*.
- <sup>54</sup> *ibid.*, p. 3.
- <sup>55</sup> Center for Climate and Energy Solutions, 2015, *Outcomes*.
- <sup>56</sup> UNFCCC, 2015, *Paris Agreement*, Article 21.
- <sup>57</sup> UNFCCC, 2016, *Paris Agreement – Status of Ratification*.
- <sup>58</sup> McDonnell, T, 2016, 'Trump wants to "renegotiate" the Paris climate deal', *Mother Jones*, 17 May, retrieved 30 May 2016, <http://www.motherjones.com/environment/2016/05/trump-wants-renegotiate-paris-climate-deal>

- 
- <sup>59</sup> Jacobs, B, 'Donald Trump would allow Keystone XL pipeline and end Paris climate deal', *Guardian*, 27 May, retrieved 30 May 2016, <http://www.theguardian.com/us-news/2016/may/26/donald-trump-environmental-policy-climate-change-keystone-xl>
- <sup>60</sup> Bodansky, D, 2016, 'The legal character of the Paris Agreement', *Review of European, Comparative, and International Environmental Law*, 6 March.
- <sup>61</sup> Weart, S, 2016, 'International Cooperation', [https://www.aip.org/history/climate/internat.htm#L\\_M099](https://www.aip.org/history/climate/internat.htm#L_M099)
- <sup>62</sup> Bodansky, D, 2016, 'The legal character', p. 11.
- <sup>63</sup> *ibid.*, p. 4.
- <sup>64</sup> Slezak, M, 'Australia scrubbed from UN climate change report after government intervention', *Guardian*, 27 May, retrieved 30 May 2016, [www.theguardian.com/environment/2016/may/27/australia-scrubbed-from-un-climate-change-report-after-government-intervention](http://www.theguardian.com/environment/2016/may/27/australia-scrubbed-from-un-climate-change-report-after-government-intervention)
- <sup>65</sup> UNFCCC, 2015, *Paris Agreement*, Article 12.
- <sup>66</sup> *ibid.*, Article 15.
- <sup>67</sup> *ibid.*, Article 28.
- <sup>68</sup> Saveresi, A, 2016, 'The Paris Agreement: a new beginning?'
- <sup>69</sup> UNFCCC, 2015, *Paris Agreement*, Article 4.9.
- <sup>70</sup> *ibid.*, Article 4.3.
- <sup>71</sup> Center for Climate and Energy Solutions, 2015, *Outcomes*.
- <sup>72</sup> UNFCCC, 2015, *Paris Agreement*, Article 14.
- <sup>73</sup> Clemencon, R, 2016, 'The two sides'.
- <sup>74</sup> UNFCCC, 2015, *Paris Agreement*, Article 14.2.
- <sup>75</sup> Center for Climate and Energy Solutions, 2015, *Outcomes*.
- <sup>76</sup> UNFCCC, 2015, *Paris Agreement*, Article 6.2.
- <sup>77</sup> Clemencon, R, 2016, 'The two sides'.
- <sup>78</sup> International Rivers, 2008, *Rip-offsets: The failure of the Kyoto Protocol's Clean Development Mechanism*, , retrieved 30 May 2016, <https://www.internationalrivers.org/resources/rip-offsets-the-failure-of-the-kyoto-protocol-s-clean-development-mechanism-2649>
- <sup>79</sup> UNFCCC, 2015, *Paris Agreement*, Article 6.2.
- <sup>80</sup> Green, F & R Finighan, 2012, *Laggard to leader: How Australia can lead the world to zero carbon prosperity*, Beyond Zero Emissions, retrieved 30 May 2016, [http://media.bze.org.au/Laggard\\_Leaderv1.pdf](http://media.bze.org.au/Laggard_Leaderv1.pdf), pp. 24-28.
- <sup>81</sup> United Nations Framework Convention on Climate Change (UNFCCC), 2015, *Report of the Conference of the Parties on its twenty-first session, held in Paris from 30 November to 13 December 2015, Addendum Part two: Action taken by the Conference of the Parties at its twenty-first session*, para. 105.
- <sup>82</sup> *ibid.*, para. 106.
- <sup>83</sup> *ibid.*, para. 120.
- <sup>84</sup> *ibid.*, para. 134.
- <sup>85</sup> UNFCCC, 2016, *Status of the Doha Amendment*, retrieved 30 May 2016, [http://unfccc.int/kyoto\\_protocol/doha\\_amendment/items/7362.php](http://unfccc.int/kyoto_protocol/doha_amendment/items/7362.php)
- <sup>86</sup> Victor, D & Leape, JP, 2015 'Global climate agreement: After the talks', *Nature*, 25 November, vol. 527, 439-441.
- <sup>87</sup> Victor, D, 2015, 'Why Paris worked: A different approach to climate diplomacy', *Yaleenvironment* 360, 15 December.
- <sup>88</sup> McDonnell, T, 2016, 'Trump wants to "renegotiate"'
- <sup>89</sup> Currie, S, 2015, 'COP21 – The Paris Agreement', *Mondaq Business Briefing*, 22 December, p. 1.
- <sup>90</sup> Topf, A, 2016, 'U.S. coal for electricity plummets to 45-year low', *Mining.com*, 31 January, retrieved 30 May 2016, <http://www.mining.com/u-s-coal-for-electricity/>
- <sup>91</sup> Arak, M & Tschikel, S, 2016, 'Why do oil prices keep going down?', *The Conversation*, 21 January, retrieved 20 May 2016, <https://theconversation.com/why-do-oil-prices-keep-going-down-53424>
- <sup>92</sup> Meisei, D, 2015, *President Obama Rejects Keystone XL. We Win.*, 350.org, 6 November, retrieved 30 May 2016, <http://350.org/president-obama-rejects-keystone-xl-we-win/>
- <sup>93</sup> Parkinson, G, 2016, 'Adani puts Galilee coal mine on hold pending recovery in coal price', *Renew Economy*, 4 February, retrieved 30 May 2016, <http://reneweconomy.com.au/2016/adani-puts-galilee-coal-mine-on-hold-pending-recovery-in-coal-price-67892>
- <sup>94</sup> Le Quéré et al., 'Global Carbon Budget 2015'.
- <sup>95</sup> Carafá, L, 2015, 'Is the US-China climate agreement a game-changer?', *The International Spectator*, vol. 50(1), 8-14, DOI: 10.1080/03932729.2015.999419
- <sup>96</sup> Clemencon, R, 2016, 'The two sides'.
- <sup>97</sup> UNFCCC, 2015, *Paris Agreement*, Article 4.11.
- <sup>98</sup> Center for Climate and Energy Solutions, 2015, *Outcomes*.

<sup>99</sup> Bodansky, D, 2016, 'The legal character', p. 18.

<sup>100</sup> Center for Climate and Energy Solutions, 2015, *Outcomes*.