

The Two Sides of the Paris Climate Agreement: Dismal Failure or Historic Breakthrough?

Journal of Environment & Development

2016, Vol. 25(1) 3–24

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DOI: 10.1177/1070496516631362

jed.sagepub.com



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Abstract

The December 2015 Paris Climate Agreement is better than no agreement. This is perhaps the best that can be said about it. The scientific evidence on global warming is alarming, and the likelihood depressingly small that the world can stay below a 2°C—even less a 1.5°C warming—over pre-industrial times. The Paris Agreement does not provide a blueprint for achieving these stabilization objectives. But it is ultimately the hope, however small, that a fundamental and rapid energy transition is achievable that must inform social and political behavior and activism in the coming years. In this sense, the Paris outcome is an aspirational global accord that will trigger and legitimize more climate action around the world. The question is whether this will happen quickly enough and at a sufficient scale to avoid disastrous warming of the planet. What is certain is that it will not occur without determined and far-reaching government intervention in energy markets in the next few years, particularly in the largest polluting countries.

Keywords

climate negotiations, Paris Climate Agreement, U.S. politics, sustainable development

The climate agreement adopted at the 21st United Nations Climate Conference (COP21) in Paris in December 2015 has officially abandoned the idea of an international equitable burden-sharing arrangement to control and reduce carbon emissions based on multilaterally negotiated binding emissions targets and time tables for each country, the foundation of the 1997 Kyoto Protocol. By

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that it has effectively sidelined equity and environmental justice considerations as a guiding principle for multilateral cooperation. It has let the developed world largely off the hook for its massive historic contribution of CO₂ that has already accumulated in the earth's atmosphere. It instead is pressuring developing countries to control their future emissions while leaving the poorest and most vulnerable countries exposed to the threat posed by ever-increasing greenhouse gas emissions for which they have no responsibility (World Bank/Potsdam Institute, 2012). The Paris Agreement is built entirely around voluntary country pledges—as different as the countries they are coming from—which are still far from adding up to achieving the objectives the agreement defines. In its basic architecture, the Paris Agreement is a complete victory for the United States which has obstructed effective climate action for more than two decades but now claims leadership credentials for its role in getting all countries to sign off on this global accord.

The Paris Climate Agreement has to be understood in its historic context. From the late 1980s on, it was the European Union (EU) that pushed for binding emission targets and timetables, with the United States firmly rejecting such targets when the 1992 Framework convention was adopted (Cléménçon, 2010, 2016; Leggett, 2001). In 1997, the United States during the Clinton administration ultimately agreed to the Kyoto Protocol, which now included targets and time tables for developed countries. Kyoto built on the principle of common but differentiated responsibilities of developed and developing countries which the 1992 Framework Convention on Climate Change had set out (Article 4) and the need for developed countries to take the first steps to reduce their greenhouse gas emissions before developing countries would be asked to do so.

The effort to get the United States on board the Kyoto agreement came at a price: The EU had to agree to the principle of emissions trading, that is, to the idea that countries would be able to purchase emissions rights from other countries or get offset credits by financing projects in developing countries that reduce emissions. This was the ultimate neo-liberal market concession to the climate process, an instrument advocated by many mainstream economists, but one that never worked as it was supposed to as the experience with the European emissions trading system introduced in 2005 has proven (Laing et al., 2013). The simple alternative of course would have been a carbon tax, which industry at the time fought tooth and nail (Barnes & Barnes, 1999). The difference between cap-and-trade and carbon tax is that the former allows the private sector to accrue all proceeds from optimal management of emissions rights, and as it turned out to use many opportunities to game the system without reducing overall emissions (Chan, 2010). Revenues from carbon taxes—as they were implemented in a number of European countries on a limited scale—accrue to governments which can use them to offset other taxes and support renewable technologies and energy conservation (the double dividend). It was a colossal mistake to push emissions cap-and-trade systems as the global solution to climate change mitigation instead of scaling up carbon and energy taxes. It set climate politics back by two decades.

Despite getting its way in terms of emissions trading in the Kyoto Protocol, the United States in 2001 stepped away from the agreement after George W. Bush became president and thereby doomed the idea of an equitable burden sharing arrangement for reducing global greenhouse gas emissions. Canada, Australia, Japan, and Russia eventually have stepped away from the Kyoto Protocol as well following the United States lead; in Canada and Australia after conservative governments were elected with the critical help of the fossil fuel industry.

The U.S.'s key argument of course is valid: Nothing developed countries do will matter if the large emerging economies are not held accountable for their rapidly growing emissions. But this understanding could have been accommodated in a second phase of a Kyoto-type framework, *after* developed countries have shown their leadership. After all, it was the United States that spearheaded the design of the successful Montreal Protocol to phase out ozone-depleting substance in 1987, which uses binding reduction targets and time tables and differentiates between developed and developing countries (Benedick, 1991).

But the United States, for domestic political reasons, never was in a position to accept a climate agreement formally based on mandatory recognition of past emissions. It therefore advocated for a universal global agreement that would include binding provisions for developing countries as well, particularly China and India. This was the political constellation going into the Copenhagen climate conference in 2009 and remained so before the Paris conference. The cost of this approach, however, is that it greatly reduces pressure on the developed country polluters to commit to ambitious emissions reductions.

Dialing Down Expectations Before Paris

The Paris climate talks were a carefully managed event set on track the year before at the climate conference COP20 in Lima with the idea that countries will submit intended nationally determined contributions (INDCs) well before the conference begins. It was hoped that this would facilitate a comprehensive agreement because commitments of countries would be known already. Going into the Paris negotiations, many countries—notably the EU—continued to insist publically that there would be no agreement without binding emissions reduction commitments however emphasized at the same time that the first priority for Paris was to find a path to completely decarbonize the world economy by the year 2100, suggesting that there are different ways to achieve such a broad objective (“EU-Ziele für Paris-Gipfel,” 2015).

The voluntary INDC process preempted a serious attempt to negotiate binding emission commitments because countries' pledges were already known before the conference started. This left common global objectives such as a long-term vision, procedural issues related to review cycle, monitoring and reporting guidelines, and financial and technology support on the negotiating table. In this sense, the objectives for the Paris conference were from the start

less ambitious than they were for the Copenhagen conference were legally binding emissions targets for developed countries were still a core objective.

During the Paris conference, U.S. Foreign Secretary John Kerry was able to convince reluctant nations that insistence on binding commitments would lead to a failure of the conference. At a press briefing at the beginning of the conference, Todd Stern—the U.S. special envoy for climate change—sold U.S. opposition to any binding commitments with the argument that by not requiring legally binding targets, more developing countries will be motivated to take action. “We are quite convinced that there are many countries who would be inclined to put in a lower target than they’re really capable of if they were worried about the legally binding nature of the targets themselves.” He could have mentioned the true reason of the U.S. position which is that the United States government is held hostage on the climate issue by a right-wing Congress in which a majority does not believe in human-made climate change and in which the Senate majority leader—a day after the conclusion of the Paris meeting—promised to shred any binding climate agreement put before it (“How US Negotiators Ensured,” 2015).

A fair assessment of the role the United States has been playing in Paris will have to recognize the significant turnaround in U.S. climate policy during the Obama administration despite a U.S. Congress deeply hostile to any kind of climate legislation and a United Nations (UN)-sponsored international agreement. The U.S. delegation has gone far to help build a cooperative spirit among countries with the limited tools available and President Obama appears to have been instrumental in fostering a relationship with both China’s President Xi Jinping and India’s Prime Minister Narendra Modi which ultimately helped secure the final Paris deal (“Secret talks and a personal letter,” 2014). He met both men during the opening days in Paris and is said to have repeatedly talk to them on the phone (“The Road to a Paris Climate Deal,” 2015).

Ultimately, what the United States accomplished is to have the world accept the domestic constraints in the United States as a feature of international climate talks. The Obama administration went through pains to design the Paris agreement in a way that would allow him to bypass approval by the U.S. Senate set to kill it on arrival (“Paris Talks: Obama Team Held Its Ground,” 2015). This required that developed countries would not make their commitments binding under international law, as they did in 1997 with the Kyoto Protocol. Neither could mandatory commitments for climate financing and acceptance of any compensatory responsibility for loss and damage suffered by poor countries resulting from climate change be part of it. In the end, the United States made no concessions and got essentially everything it wanted.

The United States achieved its negotiating goals partially by exploiting the fact that China with its tremendous economic growth and wealth accumulation over the last decade and with per capita CO₂ emissions of 6 tons a person compared with India’s 1.5 tons per capita, no longer shares the same interests with the poorest developing countries as it did 20 years ago (International

Energy Agency, 2014). China is facing more pressure from poor developing countries and Small Island States to reign in its massive and still growing emissions. Most African nations have per capita emissions of below 1 ton CO₂.¹

While India maintains that rich countries must pay back their historic debt they have drawn from the earth's carbon budget, China has a decreasing interest in a sharp differentiation between countries based on per capita and historic emissions. The United States also benefitted from the fact that the EU was not going to hold up any agreement—albeit its pre-conference insistence on legally binding emission targets—as it needs to shore up lagging EU enthusiasm for pulling the climate policy wagon. France, after much diplomatic effort, was furthermore desperate to preside over a successful conference even more so in the wake of the horrible terrorist attack that left 130 people dead and many more wounded in Paris 2 weeks before the conference started.

In the end, poor developing countries had no place else to go but to resign to the fact that any agreement was better than no agreement at all, particularly if a 1.5°C warming ceiling could be written into the text. Some financial support is better than no support, and an agreement that can be held up as a historic event can be expected to inspire a range of public and private sector action on renewable energy and technology from which all countries stand to benefit. For India, the hope lays in a change of global markets away from long-term investment in fossil fuels and in support of renewable technologies where India is one of the world leaders in installed capacity (Chaturvedi & Chawla, 2015). In a move that appeared explicitly intended to win India's cooperation in Paris, Bill Gates, the Microsoft founder and billionaire philanthropist, joined the Obama administration to create perhaps the largest public-private coalition for funding renewable energy. The coalition has the cooperation of 20 countries, including the United States and India, and it will feature a renewable energy research fund paid for by 28 billionaire philanthropists, including two prominent Indian businessmen ("Bill Gates to Launch Clean Energy Project," 2015).

But to have the international press chide India as the obstacle to a successful agreement as for example *The New York Times* did with a cartoon ("India at the Paris Climate Conference," 2015) shows the uncritical adoption of key U.S. talking points by much of the Western press which ignores the history of the process as well as the core equity and fairness issues at stake. It forgets that not just large India but even more so all the small least developed African and Asian countries and Small Island States have every right to demand legally binding emission reduction commitments by the largest per capita CO₂ emitters and if this cannot be achieved insist at least on more substantial financial support.

The COP21 and the Paris Agreement: Voluntary Pledges but Legally Binding Process

The Paris conference, the 21st climate conference (COP21), was the culmination of a string of annual climate conferences that defined the mandate for the Paris

Agreement and advanced work on a great many more technical issues underpinning the international climate process.² Notably, the Durban conference in 2011 picked up the pieces from the failed Copenhagen conference and adopted a mandate “to develop a protocol, another legal instrument or an agreed outcome with legal force under the Convention applicable to all Parties”—the Durban Platform for Enhanced Action. The Lima conference in 2014 adopted the “Lima Call for Climate Action” that triggered the process for submitting and reviewing INDCs ahead of the Paris conference.

The Durban Platform provided the departing point for a process to be finalized at the 21st Conference of the Parties to the Convention, COP21, in Paris. A general consensus emerged what such an agreement needed to address: (a) long-term vision and direction for avoiding global warming over 2°C or less, (b) equity and differentiation among countries, and (c) a binding process to periodically reviewing pledges and for transparent monitoring and reporting of national emissions.

What exactly *legally binding* should mean with respect to the Paris Agreement became a particularly controversial issue on which countries ultimately use different interpretations. The Paris agreement now is legally binding as far as the process staked out goes, but it does not contain legally binding provisions that require countries to take domestic legal action.

The Paris Agreement Provisions in a Nutshell

The Paris agreement is 31 pages long and includes 16 preambular clauses and 29 operative clauses. It was formally adopted by the Parties to the Climate Convention as a decision (FCCC/CP/2015/L.9/Rev.1; see United Nations Framework Convention on Climate Change, 2015).

The most important elements that define the outcome are identified in the following.

Pursuing Efforts to Limit the Temperature Increase to 1.5°C

The most positive outcome of the Paris negotiations was the acceptance of more ambitious goals than before. It sets out to hold “the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C” (Article 2).

The acceptance of a 1.5°C objective as the new global warming ceiling was the real positive surprise in Paris. Although this so far is only an aspirational objective, its normative implications as the new benchmark could prove powerful in coming years, as pressure mounts for concrete emission reduction policies to fall in line with it. Small Island States and African nations had for years demanded that global warming must be kept at 1.5°C to prevent the most severe climate change that could threaten their peoples. A broad coalition of

countries led by African states finally included the largest polluters: the EU, the United States, Canada, and China. Acceptance of this objective was also a result of heavy lobbying by global climate justice groups that had a strong presence in Paris and who had made the acceptance of a 1.5°C one of their main objectives.

Zero-Emissions by 2060–2080?

The Paris agreement specifies a long-term objective “to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century” (Article 4). The meeting could not agree on adopting more specific global reduction objectives, such as a 40% to 70%, or 70% to 95% reduction below 2010 levels by 2050. However, given the global warming ceiling specified in Article 2, most scientists interpret this to mean that global net emissions need to reach zero by 2060–2080. This as well is a new target written into an international agreement for the first time.

5-Year Review Cycle

The agreement commits countries to “formulate and communicate long-term low greenhouse gas emission development strategies” (Decision paragraph 36 and Article 4.17) and to update actions every 5 years, while each successive step has to be at least as strong as the current one (4.3).

This provision translates into countries having to submit new or renewed pledges for 2030, 9 to 12 months before the 2020 COP meeting. To base these updates on national objectives, the domestic process to firm up the new pledges would in most cases have to start no later than 2018 (Decision paragraph 23/24).

Developing countries like India and Saudi Arabia had argued for a 10-year cycle, which would have postponed the next review and strengthening of INDCs until 2025, instead of 2020.

What Is Missing in the Paris Agreement

No Legally Binding Emission Targets

As discussed, the Paris Agreement has fundamentally abandoned the idea of legally binding emissions reduction commitments, based on the principle of fair and equitable burden sharing that takes a) historic and future emissions into account as much as b) vulnerability and economic capacity to reduce emissions and adapt to a changing climate. The historic responsibility of developed countries for greenhouse gases that have already accumulated in the earth atmosphere in particular have long been at the center for proposals on how to distribute future emission rights (see for example, Den Elzen et al., 2013).

The Paris Accord for now has moved away from using historic equity considerations as base for binding country commitments.

It is important to point out that nothing prevents a future conference to come back to try to hammer out legally binding emissions allocations such as for after 2030. Perhaps this will be possible in 2021, after the U.S. Congress passes a far-reaching climate bill with bipartisan support and needs to level the international playing field to protect its domestic energy transition from dirty foreign competition, similarly to what happened when the United States led the negotiations that resulted in the Montreal Protocol to phase out ozone-depleting substances three decades ago (Benedick, 1991).

No Specifics on Financial Support

Financial support for developing countries can be seen as a proxy for differentiated emissions control commitments. At the Copenhagen conference in 2009, developed countries committed to provide \$100 billion in financial support to developing countries for mitigation and adaptation measures by 2020, which they said would come from both public and private sources. They also committed to a fast start to scale up resource mobilization before 2020. The question to what extent countries have indeed lived up to their promise was one of the most controversial issues at the Paris conference.

A report published in October 2015 by the Organisation for Economic Cooperation and Development (OECD) finds that \$62 billion in climate finance from private and public sources was committed in 2014 by developed countries and multilateral banks toward the goal of \$100 billion per year by 2020 (OECD, 2015). According to the OECD, the \$62 billion reflects a significant jump over the \$52 committed in 2013. However, many observers and developing countries criticize the OECD report as deeply flawed and greatly exaggerating actual flows.

An analysis of the OECD report by the Indian Ministry of Finance (Ministry of Finance, Climate Change Finance Unit, Government of India, 2015) points to inconsistent methodologies used to assess individual countries' financial payments and lack of independent verification, as only aggregate numbers were reported. An Indian official suggested that the true amount mobilized by rich countries may only be \$2.2billion, not \$57billion ("Paris Climate Talks: Indian Officials Accuse," 2015). A World Resources Institute working paper also highlights large transparency problems with the way *climate relevant* financing is measured and the need to step up efforts to grow financial flows in the coming years (Westphal et al., 2015).

The fact is that the sources, instruments, and channels that should count toward the Copenhagen financing pledge remain ambiguous at best. The OECD report provides little clarity on actual financial flows because countries report according to their own methodology. Much of the claimed climate

financing is relabeling or redirection of existing official development flows and uniform and comparable reporting standards for what is considered additional climate financing from private sources do not exist.

Financing remains perhaps the most important issue influencing how quickly developing countries will move on implementing their INDCs, particularly the conditional pledges that most of them contain.

No Liability Provision Linked to Financial Compensation for Loss and Damage

Least developed countries and island states pushed hard for a liability clause that would recognize their right to compensation for loss and damage suffered from climate change from countries that are historically responsible for the atmospheric build-up of greenhouse gases. Although the world's richest countries ultimately accepted that there was a need to recognize loss and damage from extreme weather events in a UN climate deal, any hope that such a recognition would be linked to concrete compensation separate from climate financing was not fulfilled. The Paris Agreement instead references existing financial flows and echoes a vague G7 pledge from June 2015 to ensure that 400 million people in vulnerable regions would have access to climate insurance by 2020, up from an estimated 50 million in 2015.

No Change in Basic Policy Premises

There are many more issues that are not addressed or mentioned in the agreement which have great relevance for efforts to de-carbonizing the world economy. Perhaps not surprisingly, the Paris Agreement does not address fundamental problems with the global capitalist economic system and how it continues to foster reliance on fossil fuel to drive economic growth in the short to medium term. Perhaps most importantly, there is no attempt to address the gapping inconsistencies between international climate and international trade liberalization objectives which countries continue to pursue side-by-side with no coordination. Neither are any concerns being raised about the effectiveness of key policy approaches still being widely advocated such as of emissions trading and the expansion of palm oil biofuel production which threatens remaining tropical forests.

How Much Time Is Left to Keep the World From Warming Beyond 1.5°C?

Climate negotiations over the last year took place before a steady flow of new scientific data adding urgency for action. The year 2015 began with the warmest winter on record on a global scale and ended as the hottest year since records

began, with average global temperatures reaching 1°C above pre-industrial levels for the first time (“A Milestone Year?,” 2016) after 2014 had already broken new temperature records (NOAA, 2015). A much noted World Bank/Potsdam Institute report produced in 2012 gives a dire outlook of what the impact of a 4°C warmer world would be. Recent studies on the impact of climate change warn of more rapidly unfolding consequences of global warming than previously projected which could render parts of the world uninhabitable and greatly affect food production within the next 50 years (Pal & Elthair, 2015).

Before this background, the urgency to reduce emissions was universally recognized by most countries’ governments present in Paris, but the task to reduce emissions to a level in line with a 2°C or even 1.5°C objective seems daunting. According to the IPCC’s 5th Assessment, the world can emit an additional 1,000 billion tons (Gigatons) of CO₂ until 2100 if it wants to stay below the 2°C temperature increase target. In 2014, global anthropocentric carbon emissions amounted to about 52.7 GtCO₂e (Gigatons CO₂ equivalent), and at current emission growth rates, the 1,000 billion ton allowance would be used up by shortly after 2030.

The United Nations Environment Programme (UNEP) in its Emissions Gap Report projects that global emissions should not exceed 42 GtCO₂e in 2030 (range: 31–44) if 2°C is the target and be not more than 39 GtCO₂e for a 1.5°C landing (UNEP, xvii). UNEP puts the probability at 66% that this would keep temperature increases below these benchmarks, highlighting the significant uncertainties one needs to be aware of with these projections of complex global cycles. UNEP also projects that to have a 50% chance of keeping global warming below 1.5°C, global greenhouse gas emissions would have to fall from an expected 56 GT of CO₂e in 2020 to just 8 by 2050 and emissions need to have fallen to below zero by 2060 to 2080 for 1.5°C or by 2080 to 2090 for 2°C, meaning that more CO₂ is being removed than added to the atmosphere.

Without any further policy measures, the world is on track to a 4°C warming by 2100. But even if all currently pledged voluntary INDCs are fully implemented, global emissions in 2030 would be 12 GtCO₂e above its allowance for avoiding a warming of more than 2°C, putting the world on track to a temperature rise of around 3°C by 2100. Various think tanks have pointed out the significant potential for additional reduction that has already been identified by governments conditional on financial and technology support. Canceling planned coal power plants would be particularly important. There are still 2,440 coal plants planned for construction around the world even in developed countries like Germany, the United Kingdom, and the United States, not to speak of China, India, South Africa, and many poor developing countries which still have few other sources of cheap energy (“Coal Plant Plans Could Wipe Out Hope,” 2015).

Singling out coal plants seems an obvious first step, but more potent sources of emissions must be tackled at the same time if not with more urgency. Methane emissions related to both agriculture—particularly meat production for growing developing economy markets—and fracking for natural gas may be more effective targets for reducing greenhouse gas emissions. Global livestock production accounts for approximately 15% of greenhouse gases (Food and Agriculture Organization, 2013).

Countries bank on *negative* emissions to play a significant role in reducing overall emissions resulting from reforestation to absorb CO₂, carbon capture, and sequestration and possibly more high-tech solutions that take carbon out of the atmosphere. But there is little agreement among countries how to prioritize different options as the political implications for choosing among them are large. Many observers and scientists are worried about the emerging unquestioned reliance on future negative-emission technologies (or geo-engineering solutions to global warming) to deliver on the Paris goals (see for example Anderson, 2015). They see no indication that such technologies will be available at the scale and low cost needed and without dramatic impacts on land use and other unforeseeable consequences.

UNEP highlights the stark consequences of delayed action and the importance of immediate strengthening of emission reduction targets. As new carbon-intensive infrastructure gets locked in in the coming years, cost for critical medium-term emission reductions necessary to have a chance to avoid rapid warming become more costly. This is why the coming years will be critical in determining global emission trajectories by 2030.

How Much Will INDCs Reduce Emissions?

INDCs are the corner stone of the Paris agreement (national submissions are posted on the United Nations Framework Convention on Climate Change website, see UNFCCC, 2015). They are voluntary pledges that countries have reported ahead of the Paris conference but use widely different methodologies to determine national emissions, setting baselines, and defining future objectives which makes them difficult to compare. As discussed in the previous section, if all currently pledged INDCs are implemented, global emissions in 2030 would still be 12 GtCO₂e above what is seen as necessary and put the world on track to a temperature rise of around 2.7°C to 3°C by 2100, far from the 2°C target the Paris Agreement defines as the upper ceiling (see Climate Action Tracker, 2015).

An assessment of INDCs points to significant transparency gaps that leave much room for interpretation and thus create large uncertainties about the impact on emissions the INDCs would have. Among the think tanks providing independent assessments of INDCs are Climate Action Tracker, a European consortium that includes Climate Analytics, EcoFys, the NewClimate Institute,

and the Potsdam Institute for Climate Impact Research (Climate Action Tracker, 2015) and the World Resources Institute (Damassa et al., 2015).

The following section briefly describes the INCDS put forth by the EU, the United States, Japan, Brazil, China, and India, mostly as an illustration of the different approaches countries are taking. The EU and the U.S. situation is described in more detail, as these are still the richest countries with the highest per capita emissions who need to take the lead to substantially strengthen their commitments.

European Union

The EU and its Member States continue to commit to the most ambitious climate policy targets among developed countries. The EU in October 2014 adopted its legally binding emissions target of at least 40% reduction by 2030 over 1990. The target represents a significant progression beyond its current commitment of a 20% emission reduction commitment by 2020 compared with 1990 (which it has almost achieved already). It is in line with the EU objective to reduce its emissions by 80% to 95% by 2050 compared with 1990. The EU and its Member States have already reduced their emissions by around 19% on 1990 levels while gross domestic product (GDP) has grown by more than 44% over the same period. As a result, average per capita emissions across the EU and its Member States have fallen from 12 tons CO₂-eq. in 1990 to 9 tons CO₂-eq. in 2012 and are projected to fall to around 6 tons CO₂-eq. in 2030.

While the EU compares well with other developed countries, it has struggled to keep its internal momentum on climate change going in line with long-term emissions reduction objectives for 2050 and beyond. Shifts to the right in several European countries, notably the East European coal countries, has made it more difficult to find common ground on more ambitious steps to de-carbonize the economy. Central and Eastern EU member states in particular are balking at stricter renewable energy targets and faster phase out of coal with Poland being one of the most outspoken opponent of a more ambitious EU energy and climate policy.

Recent personnel changes in the EU Commission which has far-reaching authority to shape EU climate policy have also brought about changes in priority away from more ambitious climate policies. In September 2014, the former European Commissioner Connie Hedegaard, a Danish politician and well-respected figure in international environmental politics who presided over the Directorate-General for Climate Action was replaced by Miguel Arias Cañete, a former Spanish oil manager with no environmental credentials ("New EU Energy Commissioner" 2014). Environmentalists were also concerned by the decision to fold the Climate and the Energy Directorate into one, eliminating a distinct climate voice in the Commission.

A major challenge to EU climate and energy policy comes from some European industry leaders who fear a negative economic impact of a go-it-alone approach. They have invested heavily in promoting the argument that Europe—with a much larger population than the United States but only 11% of the world's emissions—cannot save the planet on its own, but risks high economic costs when its industries are driven out of the EU zone by cheaper and dirtier competitors from abroad (“Klimapolitik nervt Europas Stahlkocher,” 2014). Dramatically lower oil prices and reduced subsidies for renewable energy will increase immediate economic costs for emissions reductions in EU member countries. If other countries do not appear serious about strengthening their INDCs, EU policy makers will be hard pressed to move ahead unilaterally with the necessary steps that line up with the Paris Agreement objectives.

The United States

The United States pledged to reduce total greenhouse gas emissions by 26% to 28%, from 2005 levels, by 2025. The bulk (80%) of that total is energy-related carbon emissions, the remainder coming from other gases such as methane. The U.S. pledge to reduce emissions by 26% to 28% by 2025 (from 2005 levels) amounts to a 16.3% reduction in greenhouse gas emissions compared with 1990 levels which puts it below the 40% reduction goal the EU has adopted for 2030.

Core element of the U.S. pledge is the Environmental Protection Agency's new rules for coal-fired power plants and support for renewable energy technologies. U.S. carbon emissions have come down in recent years, largely due to dropping natural gas prices which have led to a shift away from coal. Greenhouse gas emissions in 2013 were 9% below 2005 levels—a high emission year—but emissions increased by 2.0% from 2012 to 2013, the last year for which the Environmental Protection Agency (2016) has published data. The U.S. Energy Information Administration (2015) projects that U.S. emissions have grown further by 0.7% in 2014 but may have dropped by 1% in 2015. This suggests that U.S. emissions have increased slightly during the 2013–2015 period while there are increasing concerns that U.S. methane emissions have been systematically underreported (Wright & Villacis, 2016).

The United States continues to struggle with a broad and coherent climate and energy policy. The last attempt to pass climate and energy legislation in the U.S. Congress failed in 2009 (Pooley, 2010) and the political conditions have only worsened since. U.S. climate policy depends on President Obama's executive orders to reduce carbon emissions from coal-fired power plants and to expand renewable energy technologies. The election of a Republican President in 2016 would most likely lead to revoking these orders, leaving the achievement of current U.S. climate goals up in the air.

Japan

Japan has pledged a 26% emissions reduction by 2030 in comparison to 2013 levels, which it says is a reduction of 25.4% compared with 2005, the year the United States has introduced as its base year. Per capita emissions are 11 tons CO₂e/per person in 2013, and emissions per GDP are 0.29 kg CO₂e/USD in 2013.

The selection of 2013 as the base year has been criticized as far from adequate (“Japan Outlines 2030 Carbon Target, 2015”). Compared with 1990 levels, Japan’s target would represent a mere 18% cut compared with the minimum 40% cut pledged by the EU. Japan, the world’s fifth biggest emitter of CO₂, already seriously watered down its original Copenhagen pledge of 25% below 1990 levels in November 2013 as the shutdown of its nuclear plants after the 2011 Fukushima disaster forced its utilities to burn record amounts of gas and coal to generate power.

If it follows through on its renewable energy policy, Japan would be on track to meet the revised 2020 pledge without having to use forest sinks and overseas credits, despite the fact that it has stopped the operation of the vast majority of its nuclear power plants.

China

China officially announced its INDC on June 30, 2015 and has pledged to reduce its carbon intensity of the economy by 60% to 65% compared with 2005 by 2030, to increase the share of non-fossil fuel energy to 20% by 2030, and to peak emissions by 2030 the latest. During President Xi Jing’s visit to the United States on September 25, 2015, China declared that it will adopt a nationwide cap-and-trade system by 2017. China has had local emission trading trials underway since 2013 (Buckley, 2015).

Chinas’ pledge translates to a reduction in energy intensity by about 4% per year instead of the 3% per year per previous announcements (Carraro, 2015). But China’s pledge lacks specificity in important regards (Westphal et al., 2015, pp. 11–12). It does not specify at which level emissions should peak by 2030, and neither does it provide a base year against which its target to reduce carbon intensity by 60% to 65% should be measured. The countries INDC neither details accounting assumptions or methodologies that will be used for evaluation of its pledge.

India

India has pledged to reduce the emissions intensity of its GDP by 33% to 35% by 2030 from 2005 level. India had in the past declared a voluntary goal of reducing the emissions intensity of its GDP by 20% to 25%, over 2005 levels, by 2020. It has per capita emissions of 1.6 tons per person and ranks 135th among countries

as one of the least developed countries. But with total CO₂ emissions of 1.97 billion tons, it is currently also the third biggest emitter.

India has been very vocal that it will neither give a peaking year for its emissions like China nor give an absolute emissions reduction target like many developed countries are doing. Its domestic politics have been torn between more cooperative, internationalist and non-cooperative nationalist views who maintain a strong stance that climate change is not India's problem despite recent extreme weather events that have impacted India (Dubash, 2012). But by many accounts, India's renewable energy target is more ambitious than that of the United States (according to the Centre for Science and Environment in New Delhi). The Centre for Science and Environment's projections show that in 2030, India will have about 250 to 300 GW of solar and wind energy capacity. Under the Clean Power Plan, the United States will reach 275 GW solar and wind capacity by 2030. China has pledged 300 GW solar and wind power by 2030.

Brazil

Brazil has pledged to cut emissions by 37% by 2025, with the ambition to reach a 43% reduction by 2030. Both targets will be measured against a 2005 baseline. Under the plan, renewables will make up 45% of the country's total energy mix by 2030, up from 40% today. Brazil also plans to increase the share of sustainable biofuels by 18% and boost the share of renewables from non-hydropower sources to at least 23% by 2030.

The country, which has been at the center of global efforts to halt widespread illegal deforestation, also promised to halt illegal deforestation and reforest 12 million hectares of land by 2030. Climate Action Tracker ranks Brazil's INDC as one of the most ambitious one, and close to adequate to what the country should adopt in line with the global objectives the Paris Agreement sets out.

Does the Paris Agreement Provide Reason to be Optimistic?

The Paris Agreement represents a universal agreement to tackle climate change as an urgent and serious threat to humankind which for the first time ever all countries have signed on to. It includes reference to a common goal to keep global warming well below 2°C, even 1.5°C, to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century (which means reducing net global emissions to zero by 2060–2080), and it establishes a binding review cycle that requires countries to report every 5 years on implementation of their voluntary INDCs.

Laurent Fabius, the seasoned French Foreign Minister, ably steered the conference through critical moments and avoided a Copenhagen-style collapse (see ISSD for day-by-day reporting of the negotiations). When he brought down the

final gavel, there was a sense that this was a historic moment which concluded a decade-long struggle to agree on a comprehensive global climate agreement. But many felt relief mostly because of what was avoided rather than what was agreed upon.

Eighteen years after the Kyoto Protocol adopted legally binding emissions targets that however in the end only a small number of countries committed to, the world now has a global climate agreement with no specific legally binding provisions to hold countries accountable to doing much of anything except to come back every 5 years to report on their climate action. But it would be a mistake to assume that the world would be better off with no agreement. A failure of the Paris conference to deliver what it did would have been devastating, set the process back yet another 5 to 10 years and almost certainly set the world on an unstoppable path to a 3°C warming by 2100.

One has to accept that negotiating fair and equitable binding emissions reduction targets for each country was impossible. The domestic political constellations in the United States, India, China, and many other countries do not support such top-down internationally determined commitments which would require these countries to move away from long-held core negotiating positions. There is little real trust between the large developed and emerging economies and as part of their understanding of differentiated responsibilities developing countries will continue to use coal and to subsidize fossil fuels in the name of poverty alleviation programs. As a result, a bottom-up approach based on each countries' voluntary pledge may indeed for now be the only realistic way forward. But it is more difficult to accept that more specific global action goals could not be adopted that are in line with staying below the adopted warming ceiling. The agreement defines no emissions peak year, no specific emissions reduction timeline, and no concrete plans to phase out of fossil fuel subsidies, to stop construction of new coal-fired power plants, and to substantially and transparently increase financial support to developing countries.

Still, one may want to celebrate the fact that now 180 plus countries have submitted their nationally determined pledges to take action to control emissions. Although these INDCs are voluntary and not multilaterally negotiated outcomes—never before in 25 years of climate diplomacy has there been this kind of momentum from so many countries. As such, these plans reflect an unprecedented national level process involving a wider range of actors than ever before, including civil society organizations, subnational governments, and the business community, all looking for a clear market signal that the fossil age is on its way out and that investing in renewable energy technologies and energy conservation will pay off. Each country's INDC will now be scrutinized by domestic and international actors and countries will be held accountable in the court of public opinion to fulfill their own pledges, if they do not have

adopted their respective domestic legal steps. The Paris Agreement contains important provisions that improve the transparency of how countries account for and report on their emissions and policy steps to implement and strengthen their pledges.

The cautious optimism that swept the globe after the Paris conference came to a conclusion cannot hide the fact that the challenges moving forward are daunting. The IEA presented a study concluding that \$16.5 trillion in spending on renewable energy and efficiency through 2030 will be required to meet the targets in the climate agreement reached in Paris on Saturday (2015). Governments around the world will have to attempt a fundamental shift of investments towards renewables and away from fossil fuel. They will have to phase out close to \$500 billion in fossil fuel subsidies and cancel the construction of most of the 2,440 planned coal plants around the world, just for starters.

Unfortunately, the policy ideas advanced to close the emissions gap are stuck in the past. The economic growth paradigm of the last decades has been substituted with the green-growth, win-win rhetoric that the world can outgrow its dependence on fossil fuel and over-consumption with a few minor policy adjustments. Private sector voluntarism has been invoked for the last two decades, yet it has never amounted to measurable shifts away from business-as-usual. Green investment funds have been around for many years, yet never dented the business model of large corporations built on short-term profit calculations. Renewable energy technologies have only very recently started to really compete in energy markets after languishing for 2 decades. The European emissions trading system has been limping along for a decade with little real impact on emissions trajectories but now China is planning to adopt the same approach (for a more in-depth discussion of these issues see Cléménçon, 2016).

The recent past holds lessons that seem to have been forgotten. One should remember the global financial crisis of 2008 that was the result of a mind-boggling trust in free market forces and deregulation which would benefit not just the private sector but the public good as well. Instead blanked deregulation has created a world economy that has produced huge inequalities within countries and among countries and accumulated unbelievable wealth in the hands of very few, many of whom have made their fortune by exploiting fossil fuels while at the same time fighting efforts to transition to a clean energy future. Meanwhile government budgets have been squeezed and social programs cut.

Many of the free market approaches that continue to be advanced as effective solutions to the climate crisis – emissions trading and free trade - are based on the same misguided idea that market forces will solve the problem with little need for forceful regulation. As this is being written, countries like Germany the

UK and the US are in the process of approving new coal fired power plants, the car industry is enjoying a boost in the sales of SUVs thanks to a precipitous drop in oil prices, and the U.S, Argentina and Brazil are fighting over shares in the expanding export markets for beef in emerging economies like China and India that are encouraged to change their vegetarian diets to a wasteful and much more carbon-intensive Western-style diet.

There are positive trends, foremost the rapid expansion of renewable energy technologies which in some countries is now generating more than half the electricity. Equally, civil society activism on climate change has grown much more vocal and is better organized than ever before. Particularly, in the United States, it is starting to have a real impact, something that has eluded the environmental movement for more than a decade since Al Gore—a certified long-time climate activist and former Vice President—lost his presidential bid in 2000 (Shellenberger & Nordhaus, 2004). The fossil fuel divestment campaign around the world is sending important signals to investors that fossil fuels are a losing asset class and a number of large institutional investors are moving away from fossil fuel investments. Civil society activism will be critical to keep pressure on individual countries and in support of governments struggling with a divided electorate and well-organized opposition to changing the status quo.

All this could and should have come 10 even 20 years ago, but there are signs that the momentum behind these trends this time is real and can be sustained. If this indeed is the case, real change could happen more quickly than one may think possible. But even under best case scenarios, achieving the kind of emissions reduction demanded by a 2°C warming ceiling will not come without determined government intervention. Many governments have started to push harder in this direction, and the Paris agreement is a sign of that. But most of them still face significant and well-organized opposition designed to keep the lucrative business-as-usual going for as long as possible.

The true significance of the Paris Agreement will become clear within the next few years. At best it will have triggered an irreversible departure from the fossil fuel age towards rapid de-carbonization of the world economy driven by a broad coalition of public and private actors. At worst, Paris will have been another missed opportunity where international leaders made vague promises they were in no position or unwilling to fulfil. This could be devastating for the planet and its inhabitants.

Declaration of Conflicting Interests

The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author received no financial support for the research, authorship, and/or publication of this article.

Notes

1. For comparison, per capita CO₂ emissions in tons are 16.15 for the United States, 9.2 for Germany, 9.59 for Japan, and 2.2 for Brazil, but 0.7 for Angola, 0.38 for Nigeria, 0.38 for Bangladesh, 0.1 for Ethiopia, and 0.04 for the Democratic Republic of Congo. South Africa stands out with 7.2 tons due to its higher development and reliance on coal.
2. For a detailed account of climate negotiations by meeting see International Institute for Sustainable Development, the Earth Negotiation Bulletin. For a summary of COP21 and the Paris Agreement negotiations see <http://www.iisd.ca/download/pdf/enb12663e.pdf>.

References

- A milestone year? The unprecedented climate events of 2015 should prompt action on the policy stage. (2016, January 6). *Nature Climate Change*. Retrieved from <http://www.nature.com.proxy.library.ucsb.edu:2048/nclimate/journal/v6/n1/pdf/nclimate2911.pdf>
- Anderson, K. (2015). Talks in the city of light generate more heat. *Nature*. Available at: <http://www.nature.com/news/talks-in-the-city-of-light-generate-more-heat-1.19074> (accessed 21 December 2015).
- Barnes, P., & Barnes, I. (1999). *Environmental policy in the European Union*. Cheltenham, England: Edgar Elgar and Cambridge University Press.
- Benedick, R. E. (1991). *Ozone Diplomacy: New Directions in Safeguarding the Planet*. Massachusetts: Harvard University Press.
- Bill Gates to launch clean energy project on sidelines of Paris climate talks. (2015, November 27). *The Guardian*. Retrieved from <http://www.theguardian.com/environment/2015/nov/27/bill-gates-clean-energy-initiative-paris-climate-talks>
- Buckley, C. (2015, September 25). Enacting cap-and-trade will present challenges under China's system. *The New York Times*. Retrieved from http://www.nytimes.com/2015/09/26/world/asia/china-emissions-xi-jinping-limit-cap-and-trade.html?_r=0
- Carraro, C. (2015). *On the recent US-China agreement on climate change, VOX CEPR's policy portal*. Retrieved from <http://www.voxeu.org/article/us-china-agreement-climate-change>
- Chan, M. (2010). *Ten Ways to Game the Carbon Market*. *Friends of the Earth*. Available at: <http://www.fern.org/sites/fern.org/files/gamingthecarbonmarketFINAL.pdf> (accessed May 2010).
- Chaturvedi, V., & Chawla, K. (2015). India's climate leadership at Paris. India has done well to defend its development priorities, while detailing its ambitious renewable energy targets. (2015, December 17). *LiveMint.com*. Retrieved from <http://www.livemint.com/Opinion/CISfXZgUsT0TwdyW5MZ5IL/Indias-climate-leadership-at-Paris.html>

- Cléménçon, R. (2010). Pushing past neo-liberalism: Rethinking global climate negotiations. In C. Lever-Tracy & B. Pittock (Eds.), *Climate change and society: An introduction* (pp. 453–472). New York, NY: Routledge, Francis & Taylor.
- Cléménçon, R. (2016). Sustainable development, globalization and EU leadership: A historical-comparative analysis. *European Journal of Sustainable Development*, 5(1). Forthcoming. <http://www.ecsdev.org/>
- Climate Action Tracker. (2015). Retrieved from <http://climateactiontracker.org/>
- Coal plant plans could wipe out hope of holding warming below 2°C and threaten achievement of INDCs. (2015, December 1). *Climate Action Tracker*. Retrieved from <http://climateactiontracker.org/news/248/The-Coal-Gap.html>
- Damassa, T., Fransen, T., Ge, M., Pjeczka, K., Haya, B., & Ross, K. (2015, December). *Interpreting INDCs: Assessing transparency of post-2020 greenhouse gas emissions targets for 8 top-emitting economies* (Working Paper). Washington, DC: World Resources Institute.
- Den Elzen, M. G. J., Olivier, J. G. J., Höhne, N., & Janssens-Maenhout, G. (2013). Countries' contributions to climate change: Effect of accounting for all greenhouse gases, recent trends, basic needs and technological progress. *Climatic Change*, 121, 397–412.
- Dubash, N. (2012, November). The politics of climate change in India: Narratives of equity and co-benefits (*Working Paper*). New Delhi, India: Centre for Policy Research Climate Initiative.
- Environmental Protection Agency. (2016). *Greenhouse gas emissions inventory*. Retrieved from <http://www3.epa.gov/climatechange/ghgemissions/inventoryexplorer/#allsectors/allgas/gas/all>
- EU-Ziele für Paris-Gipfel: Angst vor dem nächsten Klima-Fiasko [EU-Objectives for the Paris Summit: Fear of next Climate debacle]. (2015, August 8). *Der Spiegel*. Retrieved from <http://www.spiegel.de/wissenschaft/natur/eu-kommissar-canete-nennt-ziele-fuer-klimagipfel-in-paris-a-1049108.html>
- Food and Agriculture Organization. (2013). *Tackling climate change through livestock a global assessment of emissions and mitigation opportunities*. Retrieved from <http://www.fao.org/3/i3437e.pdf>
- How US negotiators ensured landmark Paris climate deal was Republican-proof. (2015, December 13). *The Guardian*. Retrieved from <http://www.theguardian.com/us-news/2015/dec/13/climate-change-paris-deal-cop21-obama-administration-congress-republicans-environment>
- India at the Paris Climate Conference. (2015, December 6). *Cartoon by Heng Kim Songdec*. Retrieved from <http://www.nytimes.com/2015/12/07/opinion/india-at-the-paris-climate-conference.html>
- Inside the Paris Climate Deal. (2015, December 12). *The New York Times*. Retrieved from <http://www.nytimes.com/interactive/2015/12/12/world/paris-climate-change-deal-explainer.html>
- International Energy Agency. (2014). *Key world energy statistics*, 2014. Retrieved from <http://www.iea.org/>
- International Energy Agency. (2015). *Energy and climate change. Special briefing for COP21*. Retrieved from https://www.iea.org/media/news/WEO_INDC_Paper_Final_WEB.PDF

- International Institute for Sustainable Development. (2015). Summary report of COP21. Retrieved from <http://www.iisd.ca/download/pdf/enb12663e.pdf>
- International Institute for Sustainable Development. Reporting services. Coverage of UNFCCC COP21. Retrieved from <http://www.iisd.ca/climate/cop21/>
- Japan outlines 2030 carbon target ahead of Paris climate summit. (2015, April 30). *The Guardian*. Retrieved from <http://www.theguardian.com/environment/2015/apr/30/japan-outlines-2030-carbon-target-ahead-of-paris-climate-summit>
- Laing, T., Sato, M., Grubb, M., & Comberti, C. (2013). *Assessing the effectiveness of the EU Emissions Trading Scheme* (Working Paper No. 126). London School of Economics, Centre for Climate Change Economics and Policy. <http://www.lse.ac.uk/GranthamInstitute/wp-content/uploads/2014/02/WP106-effectiveness-eu-emissions-trading-system.pdf>
- Leggett, J. (2001). *The carbon war. Global warming and the end of the oil era*. New York, NY: Routledge.
- Ministry of Finance, Climate Change Finance Unit, Government of India. (2015). *Climate change finance, analysis of a recent OECD report: Some credible facts needed* (Discussion paper). Retrieved from <http://pibphoto.nic.in/documents/rlink/2015/nov/p2015112901.pdf>
- Monbiot, G. (2015, December 12). *Grand promises of Paris climate deal undermined by squalid retrenchments*. Retrieved from <http://www.theguardian.com/environment/georgemonbiot/2015/dec/12/paris-climate-deal-governments-fossil-fuels>
- New EU energy and climate commissioner ‘must drop oil shares’. (2014, September 12). *The Guardian*. Available at: <http://www.theguardian.com/environment/2014/sep/12/new-eu-energy-and-climate-commissioner-must-drop-oil-shares>
- NOAA, National Center for Environmental Information. (2015). Retrieved from <http://www.ncdc.noaa.gov/sotc/summary-info/global/201508>
- Organisation for Economic Co-operation and Development. (2015, October 7). *Climate financing momentum builds* (with support from the Climate Policy Institute). Retrieved from <http://www.oecd.org/environment/climate-financing-momentum-builds.htm>
- Pal, J. S., & Eltahir, E. A. B. (2015). Future temperature in southwest Asia projected to exceed a threshold for human adaptability. *Nature Climate Change*. Advance online publication. doi: 10.1038/NCLIMATE2833
- Paris climate talks: Indian officials accuse OECD of exaggerating climate aid. (2015, December 2). *The Guardian*. Retrieved from <http://www.theguardian.com/environment/2015/dec/02/paris-climate-talks-indian-officials-accuse-rich-countries-of-exaggerating-climate-aid>
- Paris Talks: Obama team held its ground, shaped deal around its wishes. (2015, December 14). *Climate Wire* – E&E Publishing, LLC. Retrieved from <http://www.eenews.net/stories/1060029479>
- Pooley, E. (2010). *The climate war. True believers, power brokers, and the fight to save the earth*. New York, NY: Hyperion.
- Secret talks and a personal letter: How the US-China climate deal was done. (2014, November 12). *The Guardian*. Retrieved from <http://www.theguardian.com/environment/2014/nov/12/how-us-china-climate-deal-was-done-secret-talks-personal-letter>

- Shellenberger, M., & Nordhaus, T. (2004). *The death of environmentalism. Global warming politics in a post-environmental world*. Retrieved from <http://www.eldis.org/static/DOC17924.htm>
- Sturbeck, W. (2014, October 22). Klimapolitik nervt Europas Stahlkocher [Climate Policy Annoys Europe's Steel Industry]. *Frankfurter Allgemeine*. Retrieved from <http://www.faz.net/aktuell/wirtschaft/unternehmen/klimaziele-2030-eu-klimapolitik-nervt-die-stahlkocher-13218285.html>
- The Road to a Paris Climate Deal. (2015, December 14). *The New York Times*. Retrieved from <http://www.nytimes.com/interactive/projects/cp/climate/2015-paris-climate-talks>
- UNEP. (2015). *The Emissions Gap Report 2015*. Nairobi: United Nations Environment Programme (UNEP).
- United Nations Framework Convention on Climate Change. *Intended nationally determined contributions. Country submissions*. Retrieved from <http://www4.unfccc.int/submissions/indc/Submission%20Pages/submissions.aspx>
- United Nations Framework Convention on Climate Change. (2015, December 12). *Paris Agreement: FCCC/CP/2015/L.9/Rev.1*. Retrieved from https://unfccc.int/documentation/documents/advanced_search/items/6911.php?preref=600008831
- U.S. Energy Information Administration. (2015). *U.S. Energy-Related Carbon Dioxide Emissions, 2014*. Available at: <https://www.eia.gov/environment/emissions/carbon/?src=home-b6> (accessed 11 January 2016).
- Westphal, M., Canfin, P., Ballesteros, A., & Morgan, J. (2015). *World Resources Institute*. Retrieved from <http://www.wri.org/publication/getting-100-billion-climate-finance-scenarios-and-projections-2020>
- Wright, S., & Villacis, C. (2016). Rising risk: Improving methane disclosure in the oil and gas industry. *Environmental Defense Fund*. Retrieved from https://www.edf.org/sites/default/files/content/rising_risk_full_report.pdf
- World Bank/Potsdam Institute. (2012). *Turning down the heat. Why a 4°C warmer world must be avoided*. Retrieved from <http://www.worldbank.org/en/news/feature/2012/11/18/Climate-change-report-warns-dramatically-warmer-world-this-century>

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