



*One Step forward
One Step back again*

ASSESSING THE CONSEQUENCES
OF THREE DECADES' CLIMATE
GRIDLOCK IN THE US

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EXECUTIVE SUMMARY

BACKGROUND

International negotiations addressing the global climate crisis continue in 2019. On 14 March 2019, the One Planet Summit in Nairobi considered how to build resilience to climate impacts in Africa, which was followed by Africa Climate week in Accra, Ghana. In September 2019, the UN Climate Summit in New York will consider national political ambitions. However, a necessary element that could break the deadlock—US leadership—will be absent.

By late 2016, President Obama believed his Administration had “transformed the United States into a global leader in the fight against climate change”, because the US was then on track to meet its internationally-agreed targets. This moment has now passed. Emissions growth resumed in 2018 amid the Trump Administration’s determination to roll back all Obama-era protections, and with it, an historical pattern—one step forward, one step back again—is being repeated.

SECTION I

Quantifying “Unnecessary” Emissions from 1990 to 2025

The US has taken on four climate commitments to reduce heat-trapping emissions—at Rio in 1992, at Kyoto in 1997, at Copenhagen in 2009, and at Paris in 2015—but successive generations of policymakers have faced insurmountable domestic barriers to progress.

We estimate the overall gap to these targets—what we describe as the “unnecessary” portion of emissions—is in the region of **20 billion tons (Gt)** between 1992 and 2018 and will be **5 Gt** between

2018 and 2025 (based on current trends), which is equivalent to two thirds of total *global* greenhouse gas pollution in 2018.

This is not because the agreed targets were too ambitious or costly to meet. On the contrary: US negotiators were highly successful in incorporating US preferences into agreements, and targets were eminently achievable; but the costs have been vastly exaggerated by industry-funded studies.

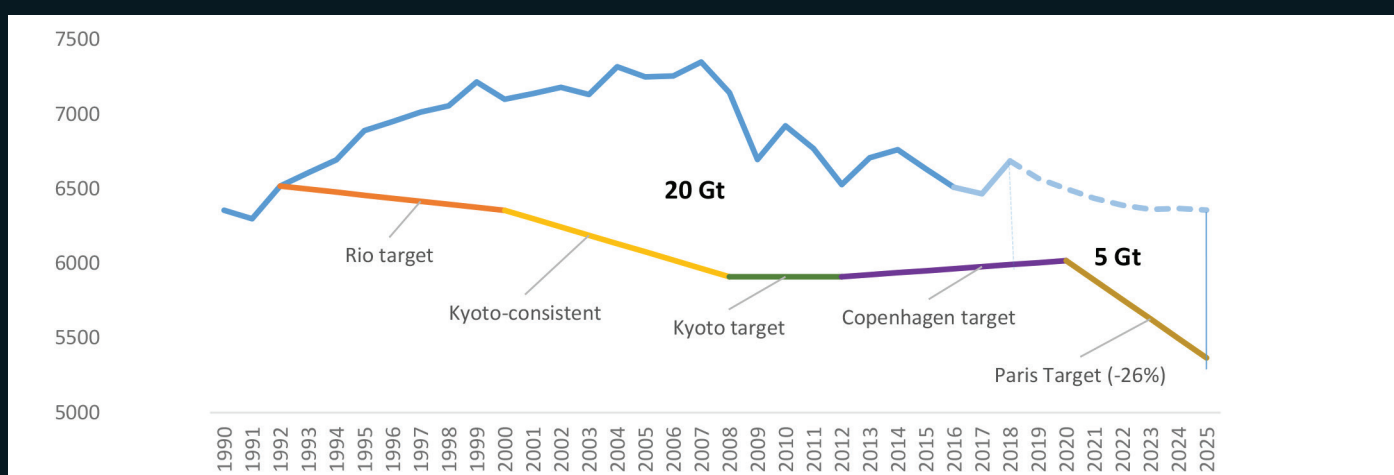
Legislative gridlock

Legislative gridlock—the failure to advance domestic policies consistent with meeting international objectives—emerges as the key factor underpinning the “unnecessary” portion of overall emissions. A BTU tax failed to win support in the Senate in 1993, while cap-and-trade legislation ran aground on four separate occasions over the 2000s; most notably in 2009, when the legislation again died in the Senate. Executive Orders to sidestep gridlock were either too modest to make an impact (Clinton), or were undermined by the subsequent administration (Obama).

We identify three structural factors underpinning legislative gridlock:

- 1. Partisanship:** perspectives on climate action have become increasingly sorted according to tribal loyalty since the early 1990s. In this political environment, the more a Democratic leader steps forward, the greater the political incentive for a Republican to step back again;
- 2. Senate procedure:** Senate rules exacerbate gridlock by enabling the Republican party to build a blocking coalition, even when it has had no political power (1991-1993 and 2009-2011); and

Emissions compared to targets agreed between 1992 and 2025 (million tons CO₂-eq)



- 3. The power of special interests:** our analysis, substantiated by a comprehensive body of academic research, highlights the importance of fossil fuel interests in undergirding gridlock through its influence over key decision makers and the wider public debate.

What are the economic implications?

We estimate that the total damage to the global economy will be approximately one trillion dollars from the “unnecessary” portion of emissions between 1992 and 2025. This quantification of damages in economic terms gives rise to questions of responsibility—moral, legal and political.

SECTION II

What are the implications for moral responsibility?

A country’s historical contribution to global emissions (or, alternatively, its contribution since 1990) has commonly been used as an indicator of “responsibility” for climate change. While useful, these metrics also have their limitations. From our analysis, “lack of progress to targets” emerges as a new metric for evaluating a country’s responsibility for climate change. We argue that this is best thought of as complementary rather than a stand-alone metric, which could be considered alongside other data—including historic emissions, emissions per capita and emissions per unit GDP—to determine legal and moral responsibility.

Could there be legal implications?

Given the economic and moral implications of “unnecessary emissions”, we next consider some avenues for legal recourse against the entities responsible for “legislative gridlock”, including:

- legal action against the United States by a third state before the International Court of Justice (ICJ);
- domestic lawsuits against the US Federal Government and State Governments and authorities; and
- legal action against major private sector emitters.

A commonality between all three types of cases is that proving causation—linking specific emissions to specific environmental or personal harm—has proven an insurmountable barrier to climate litigants in the past.

However, while the prospects for successful legal action at the ICJ remain low for the foreseeable future, there are several promising global trends indicating that future legal action might

be more successful. These include: the Paris Agreement of 2015, the increase in national climate legislation flowing from it; advances in climate science, promising legal precedents in Europe, and the number of lawsuits before US courts. These developments will continue to increase pressure on the US legal system to find answers to the constitutional, human rights and environmental questions arising from climate change damage.

Forward to 2021

If these legal avenues of recourse do not offer a high near-term probability of success, what then are the prospects for a political resolution? Our brief climate history suggests that a window of opportunity may well present itself in the post-2020 period to break the legislative gridlock, although a number of stars would need to come into alignment.

We conclude that:

- Democratic control of Government, while necessary, is clearly not a sufficient condition for success;
- Climate legislation would need to be an immediate priority for the incoming administration;
- When legislative options are being considered—from a Green New Deal, to carbon taxation, to cap-and-trade or a more piecemeal approach—the option that offers the best prospect of successfully navigating the Senate must be selected; and
- While partisanship and the power of vested interests are problems without short-term solutions, Senate rules and processes could be more immediately malleable in 2021.

Finally, a flexible and dual approach which involves advancing legislation and Executive Orders consecutively, could strengthen a future administration’s negotiation position with Congress, while managing the risk of yet another legislative impasse.

It is generally accepted that, with every year that passes, the impacts of climate change become more devastating. Global calls for a political response from the US become louder and a large and growing majority of Americans want Federal action.

This does not mean that a window of opportunity will inevitably open in 2021, or that if it does, legislation will successfully be advanced. If not, the focus may turn to litigation, and failing that, to history as the ultimate presiding judge.

INTRODUCTION

International efforts to address the climate crisis will continue in 2019 against a backdrop of steadily increasing global emissions. On 14 March 2019, the One Planet Summit in Nairobi considered how to build resilience to climate impacts, which was followed by Africa Climate week in Accra, Ghana. Although African countries are responsible for just 4% of global emissions, an estimated 65% of the continent's population¹ are already feeling these impacts in their daily lives, including heat extremes, changes in rainfall patterns and sea level rise.²

The following September, the UN Climate Summit in New York will attempt to showcase “a leap in collective national political ambition”. The objective is to send “political signals” and “inject momentum” into global decarbonisation efforts.³ However, the single biggest political signal will come from the absence of political leadership from the US, which is a necessary condition for breaking the climate deadlock.⁴

By the end of 2016, President Obama believed he had broken the deadlock and “transformed the United States into a global leader in the fight against climate change”.⁵ For a brief period, it seemed he might be right—for the first time in three decades, the US was on track to meet an internationally agreed climate target. This moment has now passed. Emissions growth resumed in 2018 following the Trump administration's determination to roll back as many climate protections as possible, actions which fit within a long-established historical pattern.⁶

The climate change dance in the US over the past three decades— one step forward, one step back again—has resulted in billions of tons of greenhouse gas emissions accumulating in the atmosphere,

which will cause trillions of dollars' damage to the global economy over the coming decades. But is it possible to quantify the “unnecessary” emissions arising from legislative gridlock, and can we determine who should pick up the tab? Looking forward to 2021, what are the prospects of escaping from this repeating pattern?

The primary motivation of this paper is to look to the past for answers to these questions within the context of options for climate legislation on the table. These include the Green New Deal resolution;⁷ the carbon “fee and dividend” model;⁸ cap-and-trade legislation;⁹ and a more piecemeal approach combining tax breaks, R&D supports and regulations. Studying three decades of Federal climate policy—and exhuming past legislative battlefields—provides a context for evaluating these options.

This paper is divided into two sections. The first reviews three decades of American climate policy within the context of climate targets agreed, and quantifies the emissions gap over the period in relation to these targets. We discuss three key factors underpinning legislative gridlock: partisanship, Senate rules and procedures, and corporate lobbying.

The second section explores the economic and legal implications of our analysis. We estimate the damage to the global economy caused by “unnecessary” emissions between 1992 and 2025, and propose “lack of progress to meet targets” as a new metric for determining climate “responsibility”. Finally, we assess the legal implications from our results for the Federal Government and major corporations, considering the prospects for international and domestic litigation.

In our conclusions, we briefly explore the implications for advancing climate legislation post-2020.

SECTION I: QUANTIFYING THE EMISSIONS GAP: RIO TO PARIS

Formal multilateral climate negotiations began in 1989, and the first authoritative assessment of climate science was produced by the UN's Intergovernmental Panel on Climate Change (IPCC) the following year. From this point onward, global efforts to find a solution gathered momentum, and over the following three decades, the US took on successive targets to reduce emissions: in Rio de Janeiro (for the 1992-2000 period),¹⁰ in Kyoto (for the 2008-2012 period),¹¹ in Copenhagen (for the 2012-2020 period),¹² and in Paris (for the 2020-2025 period).¹³ The following sections describe the interplay between international agreements and domestic legislative efforts taken to meet these targets for each period, quantifying the gap to target in each case. We then identify and discuss key barriers to progress.

1.1. The Rio Target

Under the United Nations Framework Convention on Climate Change (UNFCCC), over 160 nations committed to “preventing dangerous anthropogenic interference with the Earth's climate system.” States acknowledged their “responsibility” to “ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction”. Developed countries acknowledged there was a need for “immediate action” and that they needed to “take the lead” to reduce emissions.¹⁴

This Treaty was signed by US President, George H.W. Bush, received the unanimous consent of the US Senate,¹⁵ and therefore became the “supreme law of the land” under Article VI of the American Constitution. The final shape of this

Treaty substantially reflected US concerns. Prior to the negotiations, industry-funded bodies, most notably the Global Climate Coalition (funded by oil and coal sectors) and the Information Council of the Environment (funded by the coal and power sectors), had been established with the immediate objective of resisting¹⁶ specific emission limits that were being called for by many other countries.¹⁷

The final agreement was something of a compromise between those who wanted binding targets for developed countries and those who did not. Under Article 4, developed countries agreed that they would act with the objective of “...returning **individually or jointly** to their 1990 levels these anthropogenic emissions of carbon dioxide and other greenhouse gases... by the end of the decade”.¹⁸ The following year, as part of his Climate Change Action Plan (CCAP), President Clinton adopted this target for the US, agreeing to “return net US greenhouse gas emissions to 1990 levels by the year 2000”.¹⁹ This target—the first of four agreed to—therefore had the fingerprints of both a Republican and a Democratic President. It was associated with an international Treaty, but not legally enforceable under one; and it was ambitious, but achievable, requiring a modest 2.5% reduction in emissions over the following seven years.

In contrast to preceding administrations,²⁰ President Clinton was determined to take action to reduce greenhouse gas emissions, and, with Democratic control of Congress, the prospects for a comprehensive policy response appeared favourable.²¹ Climate action in the form of a BTU (energy) tax²² was embedded in the immediate policy priority: the President’s Deficit Reduction Act. While the White House managed to secure its passage through the House, intense industry

lobbying damaged the proposal below the water line: the National Association of Manufacturers and the American Chamber of Commerce denounced the tax and funded a campaign to target voters and Senators in coal-dependent states. It soon became clear that there was no appetite for a broad-based energy or carbon tax in the US Senate,²³ notwithstanding Democratic control.

In the absence of support from Congress, the President’s CCAP was forced to rely on ineffectual voluntary commitments to reduce emissions. Once Republicans gained control of both the House and the Senate in 1995, further efforts to introduce climate action were successfully resisted. The net result was that emissions increased by 9% over the Rio period (1992-2000) against the backdrop of an expanding economy. The Rio target, placed on the agenda by President Bush and adopted for the US by President Clinton, was exceeded by about 4.1 Gt CO₂ over the 1992-2000 period (Figure 1).²⁴

1.2. The Kyoto Target

In 1997, the world was gearing up to another climate Treaty. However, following a “highly effective lobbying

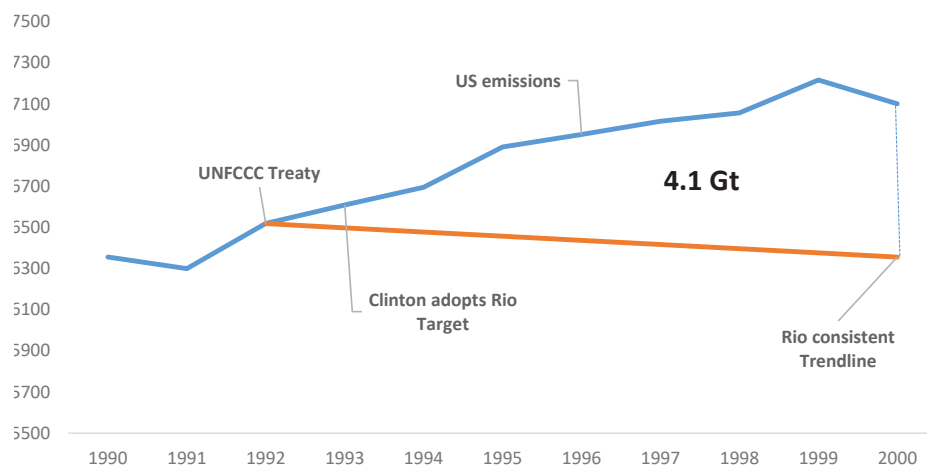
campaign” orchestrated by the Global Climate Coalition,²⁶ the US Senate had pre-emptively ruled out ratifying an agreement that left large emerging economies such as India and China unbound by targets.²⁷ While support for this position was far more equivocal than the unanimous vote suggested,²⁸ it was solid all the same (Figure 1).

At this time, the US was responsible for four times the accumulated atmospheric emissions of India and China combined, while the average American emitted about eighteen times as much as the average Indian and seven times as much as the average Chinese (appendix).

The White House knew that the Senate’s position was therefore completely untenable at international talks, and vice versa, and it pushed ahead with trying to square the circle.

The final agreement, as well as the menu of market-based options agreed to achieve targets, substantially reflected US negotiating positions. In Kyoto, Japan, President Clinton agreed that the US would reduce its emissions 7% below 1990 levels between 2008 and 2012 (when flexibilities and sinks are considered, the actual reduction

Figure 1. US emissions compared to Rio Target (million tons CO₂-eq, excluding LULUCF)²⁵



Source: Own calculations based on Climate Action Tracker (2018) emissions data

commitment was considerably lower).²⁹ The EU had pushed for more ambitious targets and timetables, but these had been considered "unrealistic and unachievable" by the US delegation.³⁰ Most notably, the legal compliance period did not begin until 2008, leaving a decade-long lead-in period. While the Kyoto target was undoubtedly a step up compared to the Rio trajectory (Figure 2), it would have required emissions reductions of only 1% per annum between 1997 and 2012. This is on par with levels of decarbonisation achieved in the US between 2007 and 2017, and also comparable with levels of decarbonisation achieved in Germany, the UK, the Netherlands, Sweden, and other developed economies over the Kyoto period. However, every year of delayed action made subsequent reductions more demanding. Yet, even this Treaty, which substantially reflected US positions on targets, timetables and flexibilities, was never presented for ratification to the Senate.

Furthermore, Congress explicitly refused to appropriate monies for "implementation [...] of the Kyoto Protocol", making progress to reduce emissions impossible.³¹ While President Clinton announced a further \$6.3 billion Climate Change Technology Initiative, encompassing a package of tax incentives and investments in 1998,³² in the absence of a more comprehensive approach, an upward emissions trajectory continued for the final years of the administration.

By the time George W. Bush was elected in 2000, the Kyoto target was already drifting out of reach. To put the matter beyond doubt, in March 2001, in the second month of his first term, the new President took two steps back on climate action. He reversed his earlier position on regulating CO₂ emissions and repudiated the Kyoto Protocol of 1997, in light of the "incomplete state of scientific

knowledge of the causes of, and solutions to, global warming change, and the lack of commercially available technologies".³³ The attitude of the administration to climate action was encapsulated by its efforts to undermine and manipulate climate science.³⁴ Attempts to introduce cap-and-trade legislation (the Climate Stewardship Act) by Senators John McCain and Joe Lieberman (in 2003, 2005 and 2007) were opposed by the White House and defeated with ease.

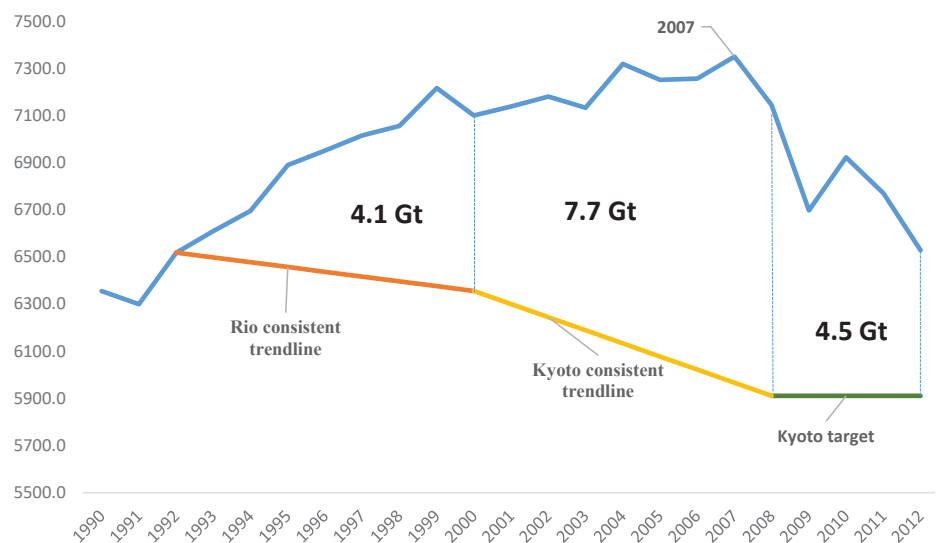
Emissions continued to increase over the following decade under an energy policy focused on promoting fossil fuel exploration and use. By the end of President Bush's second term (2008), the first year of the Kyoto compliance period, the Kyoto objective was out of sight. Notwithstanding the deep recession which took hold in 2008 and the subsequent decline in emissions, overall, between 2000 and 2012, emissions were 12.2 billion tonnes higher than they would have been had the US complied with its Rio and Kyoto targets. The Kyoto compliance period target alone was exceeded by 4.5 billion tonnes (Figure 2).

1.3. The Copenhagen Target

The election of President Obama in November 2008 heralded a change of direction. The Kyoto target had clearly become unachievable at this point, and continuing with a 1990 baseline did not cast US efforts in a favourable light. For this reason, when the incoming Administration agreed to a new target at the Copenhagen Climate conference in December 2009, it was enumerated compared to a new baseline—a 17% reduction in emissions compared to 2005 levels, not 1990.³⁵

By 2009, emissions were already 8% below 2005 levels, and this target seemed eminently achievable. When considered against a 1990 baseline, we can see (Figure 3, page 4) that the new target was in fact slightly less ambitious than what had been agreed by President Clinton a decade previously for 2012, but this time for 2020. The change of baseline was a pragmatic response: it consigned pre-2005 emissions growth to history, allowing for a more benign interpretation of subsequent efforts.³⁶

Figure 2. US emissions compared to Rio & Kyoto Targets (million tons CO₂-eq, gross)



Source: Own calculations based on Climate Action Tracker (2018) emissions data

The new reduction commitment was also self-imposed and was not legally binding.

To implement the new commitment, in February 2009, President Obama requested Congress to send him a bill “that places a market-based cap on carbon pollution”.³⁷ A cap-and-trade bill subsequently passed the House in June 2009. Senate Majority Leader, Harry Reid, along with Carol Browner, Director of energy and climate policy in the White House, proposed advancing the bill through “budget reconciliation” (a procedure where a simple majority is required to advance legislation), but this option was ultimately rejected. Despite a Democratic majority of 57 (and two additional “democratic leaning” Senators), the Bill was never presented to the Senate (it would have required 60 votes to overcome a filibuster). Furious lobbying from business and fossil fuel interests had resulted in opposition from a handful of Democrat Senators along with the overwhelming majority of Republicans. The White House was itself criticised for its less than fulsome support for the bill, and a number of

alleged missteps.³⁸ This setback largely ended the focus on domestic climate action for President Obama’s first term.

In its second term, however, the administration gave a higher priority to climate change. A Climate Action Plan consistent with the Copenhagen objective was published in 2013.³⁹ However, by this stage both House and Senate had been lost by the Democrats, and the administration was forced to rely on Executive Orders to make progress. The most important of these were: carbon pollution standards for power plants; fuel economy standards for cars and trucks; energy efficiency standards in buildings and appliances; standards to reduce methane release from landfills and in the oil and gas sector; and regulations to phase down hydrofluorocarbon production and use.⁴⁰ While controversial, these measures had the potential to make a big impact. According to White House projections from 2016, the final year of the Obama administration (Figure 3), these actions set the US on a pathway consistent with achieving its Copenhagen target, the first time

the US seemed on target to meet an international commitment.⁴¹

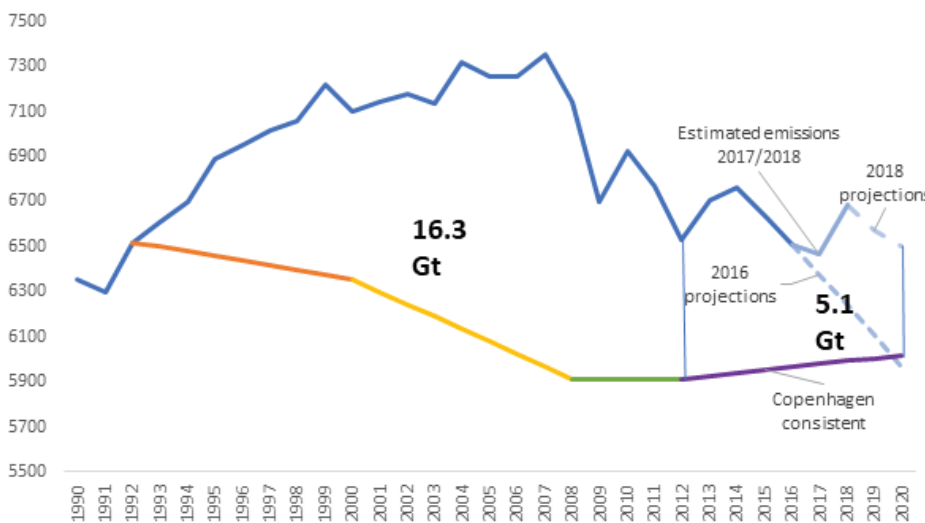
Since this point, however, the historical pattern has reasserted itself. Following the election of Donald Trump in November 2016, the key climate policy accomplishments of the Obama era have been undermined.^{42 43} As a result of these reversals (and other factors), emissions flatlined in 2017 before increasing dramatically in 2018.⁴⁴ According to the most recent projections (from Climate Action Tracker in 2018), which take account of these reversals and the concurrent failure to bring forward new measures, the Copenhagen target has already drifted beyond reach. As a result, between 2013 and 2020, an additional 5 billion tonnes of CO₂ emissions will accumulate in the atmosphere compared to targets.

1.4. The Paris Target

Towards the end of President Obama’s second term, a more decisive step forward was taken. In order secure global support for an international agreement, the US committed to an ambitious target to reduce emissions by 26 to 28% by 2025 (sticking with the 2005 baseline). As can be seen, this represented a very significant increase compared to the Copenhagen commitment (Figure 4, page 5). The Paris Agreement was subsequently ratified by 180 countries, and officially came into force on 4 November, 2016, four days before the US Presidential election.⁴⁵ However, in June 2017, President Obama’s decision to accept the Paris Agreement was reversed by President Trump.

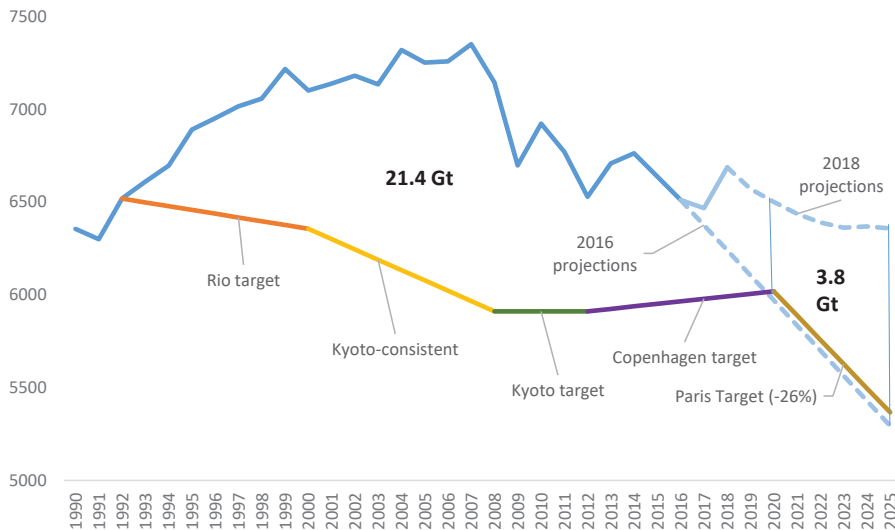
Due to the impact of President Obama’s climate policy (combined with exogenous factors such as the switch from coal to gas), at the end of the Obama administration’s second term, the US was on track to meet its Paris Agreement target. Official White House projections indicated that an

Figure 3. Copenhagen compliance (million tons CO₂-eq, gross)



Source: Own calculations based on Climate Action Tracker (2018) for 1990-2016 emissions data; Rhodium Group (2018) for estimated 2017 & 2018 emissions

Figure 4. Paris Compliance (million tons CO₂-eq, gross)



Source: Own calculations based on Climate Action Tracker (2018) for 1990-2016 emissions data; Rhodium Group (2018) for estimated 2017 & 2018 emissions and 2018 projections; White House (2016) for 2016 projections

emissions reduction of between 22 and 27% on 2005 levels could be delivered by 2025 on the basis of full implementation of all measures that had been brought forward.⁴⁶ Independent projections suggested that the US was on the right pathway, but would require further measures to be brought forward for compliance.⁴⁷ This was a positive position—after all, there remained a decade to bring forward further measures to reduce emissions. However, two years into the Trump administration and the US Paris Agreement target is all but unachievable. The current emissions trajectory will result in an additional 4 billion tons of CO₂ eq in the atmosphere compared to the lower end of Paris compliance (a 26% reduction on 2005 levels) between 2020 and 2025.⁴⁸

1.5. Factors underpinning legislative gridlock

We estimate that the lack of progress towards achieving US climate targets could therefore result in 25.2 billion tons of “unnecessary” emissions in the atmosphere between 1992 and 2025.

It is clear from our analysis that when agreed, these targets were neither “unrealistic” nor “unachievable”. In fact, US negotiators were highly successful in ensuring that targets and timetables for reducing emissions reflected national constraints.

Nor can exaggerated claims of “the draconian financial and economic burdens” be supported. Decades of non-partisan research indicates that the cost of environmental policies are modest and pay off over the longer-term (but that these costs fall on a small number of pollution-intensive sectors).^{49,50} Costs are certainly lower than industry studies, or studies from highly ideological think tanks,⁵¹ tend to claim, and the numbers produced in industry-funded studies are often based on “extensive misinterpretation of the economic and environmental evidence”.⁵² For example, before the Clean Air Act, industry claimed that the cost of sulphur reduction would be \$1,500 per ton, whereas the final cost was \$1.50 per ton.⁵³ Rather, it seems clear that legislative gridlock is the key factor underpinning the emerging gap to target. When attempts to

side-step gridlock were made by the Clinton and Obama administrations using Executive Orders, these were either too modest to make an impact (Clinton), or were rolled back by the subsequent administration (Obama). Legislative gridlock itself appears to be underpinned and reinforced by three key structural factors: partisanship; Senate procedure; and the power of special interests (Figure 5, page 6).

The increasingly partisan nature of politics in the US since the 1980s has meant that perspectives on climate action have become clearly sorted according to tribal loyalty—Democrats support action whereas Republicans do not. When control of Federal Government rests on a knife edge, as it has for the past three decades, power can switch hands at every election. Under these circumstances, the “out party” is unlikely to cut a deal, and has more to gain by playing “politics” with an issue like climate change (e.g. exaggerating the costs of taking action), with a view to winning power at the next election. According to the political scientist, Prof. Frances Lee, the net result is “...the continuous kicking-of-the-can that we complain about in American politics, in which the major issues don’t get addressed or resolved.”⁵⁴ In a partisan environment, the more a Democratic leader prioritises taking a step forward on climate action, the more driven a subsequent Republican administration will be intent on taking a step back again. Partisanship therefore helps explain the “one step forward, on step pack again” historical pattern.

Legislative rules and processes have exacerbated gridlock by allowing the Republican party to exert negative or blocking power, even when it has had no political control (from 1993 to 1995 and 2008 to 2010). While Congress passed legislation in both of these periods, the US

Senate has become a graveyard for climate legislation. Since the 1980s, Senators have become increasingly creative at using the institution's arcane rules and procedures to resist progress. The number of filibusters has increased rapidly, making it impossible to tackle big issues like climate change (60 votes are required to overcome a filibuster). Speaking to the *New Yorker*, Senator Michael Bennet has argued that dysfunction made progress nearly impossible on big issues. He argued that exceptions to this rule (financial regulation and health care), "required a year and a half of legislative warfare that nearly destroyed the body" and "depended on a set of circumstances—a large majority of Democrats, a charismatic President with an electoral mandate, and a national crisis—that will not last long or be repeated anytime soon".⁵⁵ The creative manipulation of arcane institutional processes means that Democratic political control, while a necessary condition for effective action, is not sufficient.

Partisanship and arcane legislative procedures and rules equally affect all areas of policymaking. However, the third factor appears

particularly evident in the climate policy arena. Our analysis reveals the concerted efforts of fossil fuel interests to block climate legislation by employing a range of tactics. The importance of this factor is supported by an extensive body of academic research which identifies corporate lobbying as a key factor underpinning both legislative gridlock and public confusion. For example, a Nature Climate Change study identified "the spread of scientific misinformation at a scale and level of complexity never before witnessed" as the factor underpinning the public loss of trust in robust findings from climate science.⁵⁶ According to Robert Brulle of Drexel University, between 2003 and 2010, over half a billion dollars was spent to mislead the public on the threat posed by climate change, with much of the funding provided by the libertarian Koch network. Another paper in the Proceedings of the National Academy of Sciences found that corporate funding has "influenced the production and actual thematic content of climate polarization efforts",⁵⁷ while a third paper in Nature Climate Change found that this information had

been "...highly effective in targeting key decisions makers".^{58 59} The conclusion from these studies is that lobbying from vested interests has made meaningful climate legislation "nearly impossible".⁶⁰

SECTION II: ECONOMIC AND LEGAL IMPLICATIONS

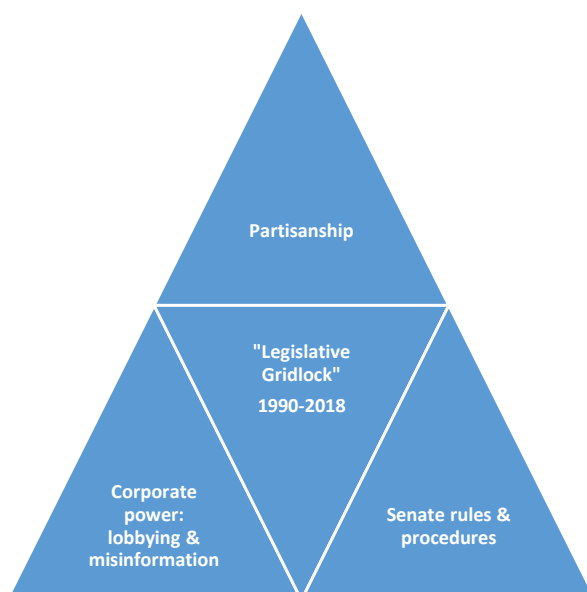
We move on to evaluate the economic, legal and ethical implications of our analysis. It is clear that greenhouse gas emissions cause damage to lives, livelihoods, natural ecosystems and the economy, but the magnitude of this damage is disputed by economists. We first estimate the total damage caused by the "unnecessary" emissions which occurred since 1992, before considering the implications for "responsibility". Finally we consider the legal ramifications, looking at international and domestic litigation in turn.

2.1. Quantifying the global economic damage

The social cost of carbon is an attempt to measure the damage caused by one ton of emissions to the global economy. As a concept, it is confronted by a number of ethical challenges and empirical limitations (Text Box 1), yet it can provide a useful starting point for considering the economic damage caused by "unnecessary" US emissions since 1992.

For the purposes of calculating the economic cost, we use a central estimate produced by an inter-agency working group of the US Federal Government. Based on a meta-analysis of a number of studies, this group found that a tonne of emissions would cause \$42 worth of economic damage in 2020 (expressed in 2007 dollars—equivalent to \$51 in 2018 dollars).⁶¹ A US Federal Court upheld the appropriateness of integrating a

Figure 5. Factors underpinning legislative gridlock



social cost of carbon into Government assessments in 2016, and supported the methodology employed.⁶² It should be noted, however, that social cost estimates are highly sensitive to input assumptions, and costs could be many orders of magnitude higher (Text Box 1).

Caveats aside, on the basis of the central estimate for 2020, produced by the inter-agency working group, we estimate that “unnecessary” US emissions released since 1992 could cause a trillion dollars’ worth of damage to the global economy. However, the marginal cost of emissions increases over time as atmospheric concentrations build, meaning that emissions prior to 2020 might be responsible for less economic damage and emissions after 2020 for higher damage. For this reason, we include higher and lower damage estimates in Table 1 for illustrative purposes.

Table 1. Cost of American Emissions for the Global Economy

| | Gt CO ₂ -eq | SCC Central estimate | Billion \$US |
|---------------------|------------------------|----------------------|--------------|
| Distance to targets | 25 | 32 | 806 |
| (2008-2025) | 25 | 42 | 1058 |
| | 25 | 52 | 1309 |

Text Box 1. The Social Cost of Carbon

Since the 1980s, the Earth Systems Models of climate scientists have provided insights into the severity and frequency of future climate impacts. Economists such as last year’s Nobel Laureate, Prof. William Nordhaus, have used this information to estimate the potential economic damage.

Just like a fantastical movie, to get any value from these efforts involves suspending disbelief and dialling down our moral judgement to some degree—we need to close our eyes and see the world instead through the eyes of an economist. This involves assuming that everything in nature—from a coral reef ecosystem, to a species of dragonfly or a pristine boreal forest—has a monetary value, and that this value is based on the commodities and services these natural phenomena provide for mankind. What we gain from our temporary suspension of disbelief is the ability to think about the costs, trade-offs and downsides associated with increasing concentrations of heat-trapping emissions in a coherent manner.

Economists who make these calculations agree—each ton of emissions has a real economic cost. But this cost is a hard number to pin down, not just because of scientific uncertainty or a lack of hard data, but also because of differing value judgements and political preferences that are hidden deep within the equations of the models used to make these assessments. Results are highly sensitive to assumptions about discount rate, climate sensitivity, the shape of the damage function etc.⁶³

A wide range of estimates inevitably arises from these uncertainties, and it is therefore unwise to place too much credence in one study. However, we can learn something from considering the findings of many independent studies. This is exactly what an inter-agency working group of the US Federal government attempted in a 2016 study.⁶⁴ They came up with a central estimate that one ton of emissions (t/CO₂-eq) caused \$42 worth of damage to the global economy in 2020—it is worth emphasising that most of the damage from US emissions will affect the global economy, and will not fall within the US. Using this damage estimate is complicated further by the fact that the incremental damage one ton of CO₂ causes increases with each ton of pollution, so that a ton of emission released in 1990 is assumed to have caused less damage than a ton of emissions released today. It should be noted that another meta-analysis of studies estimated that the SCC needs to be at least \$125,⁶⁵ and others have proposed an upper-bound of \$1,079 for emissions in 2010.⁶⁶

If Governments make businesses consider even a proportion of the damage their pollution causes, it can make all the difference. For example, the UK Government required electricity generators to pay £18 for each ton of emissions starting in 2013. This was the main factor behind the astonishingly rapid phase out of coal power generation over the next five years,⁶⁷ which fell from 36% of total electricity generated to only 5%.⁶⁸

2.2. A new metric for climate "responsibility"

What are the implications of the above estimate within the context of climate equity? A country's historical contribution to global emissions is a commonly used indicator of "responsibility" for climate change,⁶⁹ and has traditionally been an essential parameter in the climate equity debate (Text Box 2). However, the line between making a contribution and having moral or even legal responsibility for climate change cannot be so easily drawn. To make this determination, we need to disentangle complex ethical issues for which there are often no easy answers.

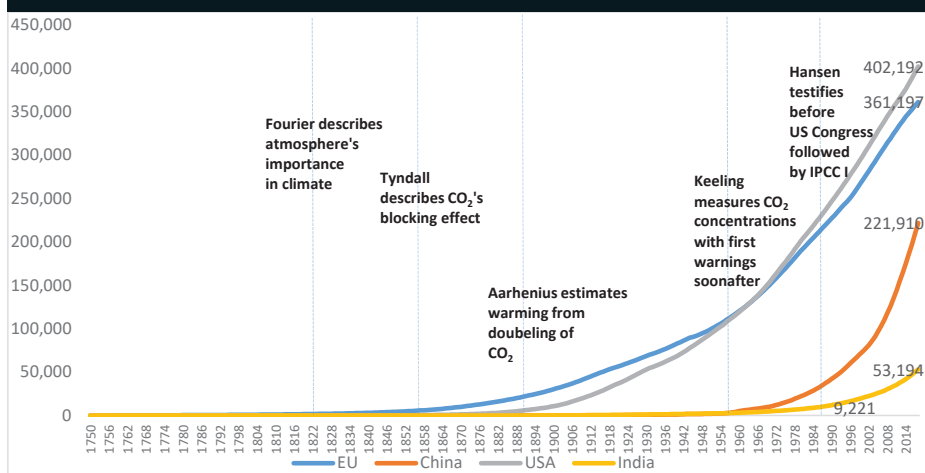
For example, can one generation be held responsible for the actions of a previous generation, especially given previous generations were unaware that a problem existed? On this basis, perhaps we should ascribe a greater weight to the portion of emissions arising since 1990 (more than half of US emissions arise from the post-1990 period)? However, is it fair to hold a country responsible for its total emissions post-1990? Is it reasonable to expect a country to reduce emissions overnight once evidence of the problem became unequivocal?

When it comes to determining responsibility for climate change, our analysis reveals a new potential metric which could sidestep some of these ethical conundrums. Perhaps moral and and/or legal responsibility for climate change can be related to how a country has performed in relation to emissions reduction objectives it has set itself? As a metric of responsibility, "lack of progress to targets" is not confounded by the same ethical uncertainty surrounded by "historic responsibility", and could be considered an indicator of "responsibility". Of course, this comes with its own challenges: for example, it seems unwise to suggest that a

Text Box 2. Historic emissions

The US has emitted about 400 billion tons of CO₂-eq into the atmosphere which is slightly more than the EU, but nearly twice China's contribution. However, there was little general awareness of climate change previous to the 1980s, and some would argue that it is more reasonable to focus on post-1990 emissions. Approximately half of US emissions arise from the post-1990 period, but the proportion is far higher for China, for example.

Figure 6. Cumulative CO₂ emissions⁷¹ in the atmosphere (million tons, 1750-2016) compared to scientific advances



Sources: Our world in data (2016)

for meeting the targets it sets itself, especially in a world where climate action has become "bottom-up". Many countries have not taken on robust or demanding targets for themselves under the Paris Agreement; in fact, in many cases targets are completely inadequate.⁷⁰ "Lack of progress to targets" is therefore best thought of as a complementary metric of climate responsibility to be considered alongside other data, such as historic emissions, emissions per capita, emissions per unit of GDP, GDP per capita etc.

2.3. Legal ramifications: who will pay?

In this section we move on to consider what, if any, are the legal ramifications of this analysis. There are a number

such implications. First, none of the four commitments discussed above are legally binding upon the US Government under international law (the UNFCCC commitment applies to all developed countries collectively; the Kyoto Protocol was never ratified by the US Senate; the Copenhagen targets were registered in an appendix, not in the Agreement itself; and the Paris "Nationally Determined Contributions" were registered with the UNFCCC Secretariat, not included in the text of the Agreement). Second, the Paris Agreement sought to downplay the possibility that damages associated with climate change could "provide a liability for compensation".⁷²

Nevertheless, this is not the final word on the matter. In fact, the issue of liability for damages from climate

change is becoming a hot topic internationally—in 2018, a slew of climate liability lawsuits was heard in courts around the world, including several targeting the US Federal Government.⁷³

Within this context we consider three potential legal avenues where the findings of this analysis might be relevant:

1. First: as an approach to determining the responsibility of one state for climate change damages hitting another country, focused on the International Court of Justice;
2. Second: as an approach to determining state liability for climate change in US Federal Courts; and
3. Third: Corporate liability for climate change damages.

2.3.1. The International Court of Justice

The International Court of Justice (ICJ) might not seem best placed as a forum for states most affected by the adverse effects of climate change to seek compensation. This is because so-called “contentious cases” (where one state sues another) can only come before the ICJ if both parties have, in some form, consented to its jurisdiction, and the United States withdrew its (limited) recognition of compulsory ICJ jurisdiction in 1986.

It further does not accept the ICJ as a dispute resolution mechanism in climate-related treaty law. The only option for the US to come before the ICJ for emissions-related damages would thus be if it explicitly agreed to the court’s jurisdiction in this matter, a highly unlikely prospect. Furthermore, the ICJ would not appear to be equipped with the legal tools to adjudicate in a contentious case on

climate change related damages. However, it has bolstered its credentials as an environmental court over the past decade, and scientific advances now make it possible to link extreme weather events in one country with damages in another.⁷⁴ While international climate litigation is perhaps something for the distant horizon, the direction of travel is tentatively towards recognition of climate change as a threat that states have a responsibility to mitigate. An important preliminary step could be to request an Advisory Opinion on Climate Change from the ICJ, precisely to clarify the abovementioned uncertainties.⁷⁵

An ICJ advisory opinion on climate change can be requested through a resolution of the United Nations General Assembly. It would not just lay the groundwork for potential future legal proceedings, but it would also make a powerful impact on global climate change governance if the International Court of Justice were to explicitly recognise the occurrence of climate change and the responsibility of states to mitigate its adverse effects. However, attempts by Palau to pass a resolution asking for an Advisory Opinion have been unsuccessful.

2.3.2. Domestic public litigation

Similar to the situation in international law, domestic attempts at litigation to hold the United States liable for tortious damages as a result of greenhouse gas emissions have, so far, struggled to establish a direct link between particular emissions and particular damages.

As noted above, recent scientific advances make establishing this link possible. A May 2017 Report by the United Nations Environment Programme (UNEP) on climate change litigation also identifies promising trends in climate litigation globally.⁷⁶

One of these is an increasing movement to “[hold] governments to their legislative and policy commitments”: these lawsuits seek to hold governments to climate change mitigation commitments they may have made at the domestic or international level. The Grantham Research Institute on Climate Change and the Environment concludes that the wider spread of climate legislation has contributed to these “strategic court cases” gaining more traction globally.⁷⁷

The landmark international case in this category of case is the 2015 judgment by a Dutch court, ordering the government of the Netherlands to limit greenhouse gas emissions to 25% below 1990 levels by 2020. This decision was upheld on appeal in October 2018.⁷⁸ While the Dutch government is appealing this decision further, the original 2015 judgment has sparked numerous similar cases, including in Ireland, to increase climate ambition in light of international commitments and constitutional duties of the state. A court ordering the government to increase its climate ambition cuts right to the core of the separation of powers, a cornerstone of modern democracies. The success of this kind of case will thus depend on how the separation of powers has been traditionally engaged with in law in the applicable jurisdiction.

Much of this wave of litigation is based on enforcing the ambition expressed by national governments in their Nationally Determined Contributions under the Paris Agreement. With the Trump administration poised to pull out of the Paris Agreement, a third category of climate lawsuit on the rise identified by UNEP might be more relevant to the climate responsibility of the US Federal Government. This category is “applying the Public Trust Doctrine to Climate Change”: essentially, this means challenging the state to act to preserve the

environment on behalf of future generations.⁷⁹ A prominent case in the US in this regard is *Juliana v. United States*. Here, a group of youth plaintiffs allege that the US government's inaction on curbing greenhouse gas emissions harmed their constitutional rights. In their complaint from October 2015, the plaintiffs state:

Our nation's climate system, including the atmosphere and oceans, is critical to Plaintiffs' rights to life, liberty, and property. Our nation's climate system has been, and continues to be, harmed by Defendants [the Federal Government]. Defendants harmed our nation's climate system with full appreciation of the results of their acts. Plaintiffs' substantive Fifth Amendment rights have been infringed because Defendants directly caused atmospheric CO₂ to rise to levels that dangerously interfere with a stable climate system required alike by our nation and Plaintiffs. The present CO₂ concentration and continuing CO₂ emissions—a function, in substantial part, of Defendants' historic and continuing permitting, authorizing, and subsidizing of fossil fuel extraction, production, transportation, and utilization—endangers Plaintiffs' lives, liberties, and property.⁸⁰

Despite multiple attempts by the Trump administration to have this case dismissed, it is continuing to move forward. Overall, domestic litigation of this sort would appear to hold out a greater prospect of success in the near term than litigation at the ICJ.

2.3.3. Corporate litigation

As identified above, industry lobbying is one of the key factors underpinning legislative gridlock in the United States. Industry action against climate regulation also extends to the legal

sphere: of the close to 1,000 climate change-related cases filed globally, corporations are the most common claimants, while governments are the most common defendants.⁸¹ A sizeable portion of climate litigation is thus directed against governments and local authorities to challenge decisions made to curb greenhouse gas emissions.⁸²

Litigation that works the other way around—state, federal or private entities seeking to sue corporations for climate-related issues—only makes up a fraction of overall climate litigation. However, a global increase in the amount of climate-related legislation and regulation, including in the US, which has gone hand in hand with advances in climate science and which has been influenced by the Paris Agreement, is providing a platform for increasing scrutiny of corporations. A recent example of this is the prominent case brought by the State of New York against ExxonMobil, where it is alleged that ExxonMobil deceived its investors about its preparedness for dealing with the costs of climate regulation.⁸³

Crucially, we also observe an increase in litigation relating to emissions-related damages, to which our quantification of “unnecessary emissions” is of relevance. So far, in the US, climate-related litigation has faced much the same issues as those identified in the above sections—establishing standing and proving causation. The prominent unsuccessful US federal court cases of *Kivalina v. Exxon Mobil Corp.* and *Comer v. Murphy Oil USA, Inc.*, both failed to clear these hurdles.⁸⁴ In particular, the 2007 landmark Supreme Court case of *Massachusetts v. EPA* served as an additional barrier for the success of these cases in federal court. This is because judges, under the “political question doctrine” were reluctant to order the defendant companies to reduce their greenhouse

gas emissions as the Supreme Court had ruled in *Massachusetts v. EPA* that this matter was one for the executive and legislative branches of power to decide, as opposed to the judiciary.⁸⁵

Recent legal research by Geetanjali et al, however, argues that the “second wave” of such “strategic private climate litigation” might have a greater chance of success due to advances in attribution science.⁸⁶ In the US, this includes cases in which local authorities are suing large oil companies such as Chevron and Shell for sea level rise.⁸⁷ Of global significance for future jurisprudence in this line of litigation will be the ruling in *Lliuya v. RWE*. In this case, a Peruvian farmer is suing RWE in the German court system for adaptation costs resulting from the melting of glaciers near his home town.⁸⁸ Mr Lliuya claims that RWE is responsible for 0.47% of annual greenhouse gas emissions, and should accordingly pay a 0.47% share of adaptation costs.

It is clear that the question of governments' legal responsibility for greenhouse gas emissions, in international and domestic law, has become exponentially more pronounced in the post-Paris era, and that it will be increasingly difficult for both courts and governments to avoid answering it. There are also signs that scientific advances in climate damage attribution could make a difference in future cases against governments, but also against corporations, as they could help overcome the previously insurmountable barrier of proving causation. Within this context, our analysis, which benchmarks US emissions against targets that have been agreed by successive Presidents at international meetings, and quantifies the gap to target therein, may also help inform future litigation efforts by providing a new and complementary metric of “responsibility” for climate damages.

CONCLUSIONS

Those who refuse to accept the reality of human-induced climate change have been described as “deniers”, but as the ravages of climate change become more pronounced in our daily lives, the debate is changing. Arguably, only the most incaltrant or those with a vested interest continue to dispute the basic science. Yet, few of us have taken the logical next step: to acknowledge the profoundly negative impact that our actions have for the wellbeing of others. Someone, somewhere, at some time, will have to pay the price for our emissions.

In this paper we attempt to quantify that tab for the US, the largest emitter historically, and the country with the most power to lead a global solution. While previous evaluations focused on historical emissions, or total emissions since 1990, we focus on lack of progress towards agreed targets. On this basis, we estimate total “unnecessary” emissions of 25 billion tons between 1992 and 2025, and damages to the global economy perhaps in the region of \$1 trillion, which inevitably gives rise to questions of responsibility—moral, legal and political.

It is clear from our analysis that the key factor giving rise to this target was not the severity of target, but rather legislative gridlock. This in turn has been underpinned by the increasingly partisan nature of US politics, arcane processes and procedures in the Senate which make it easier to form a blocking coalition. These factors have been manipulated and exacerbated by corporate interests who have the most to lose from legislative action. The net result has been a one step forward one step back again historical pattern.

We therefore propose “lack of progress to targets” as a potentially new metric of responsibility in this analysis and move on to considering the legal implications from our analysis. While the ICJ is

unlikely to provide a venue to litigate these issues in the near-term, domestic litigation offers a greater prospect of success. This is particularly so with regard to “strategic public litigation” which seeks to hold governments to their constitutional and international legal commitments. Advances in attribution science, meanwhile, will be instrumental in underpinning both public litigation and efforts to hold corporations accountable.

While the legal avenues might offer limited avenues for recourse, at least in the immediate future, perhaps the political avenue offers greater prospects for a resolution? As the US is the leading trade, economic, financial, diplomatic, military, and cultural power, the climate posture of the US has broad ramifications for global efforts to reduce emissions. As previous IIEA research has indicated, the “Trump Effect”⁸⁹ is making it harder for other countries to decarbonise by making renewable technologies less attractive, and by opening up moral covers for further defections from the Paris Agreement.⁹⁰ But these negative manifestations of US power are, in a sense, cause for hope, because the channels that have been hijacked to prevent global decarbonisation could be used to the opposite end post-2020. For example, if the US mobilized a rapid investment drive in low carbon technologies and infrastructure (under, for example, a Green New Deal), this would induce massive economies of scale, thereby creating positive spillovers for the rest of the world to benefit from in terms of cheaper green technologies. In this manner, the US could remediate some of the damage caused to the global economy by its “unnecessary” emissions.

It is clear that immediate and ambitious action is required if the Paris target is to be resuscitated, but the extent to which progress is possible will depend, first of all, on the outcome of the November 2020 elections. History suggests that a window of opportunity for broad-based

legislation may well open up, but also that it could quickly slam shut again. Every incoming President is required to make tough policy prioritisation decisions. For example, in its first term the Obama Administration advanced economic recovery and healthcare reform over climate policy, and, while legitimate policy choices in themselves, a precious window of opportunity was arguably missed. For these reasons, ambitious climate policy must be a key and immediate priority for the next US President.

The second lesson—which perhaps runs counter to the first—is that pragmatism must trump purism. It is important to compare options—from a Green New Deal, to carbon taxation, or cap-and-trade—against standard evaluation criteria such as efficiency, equity, social acceptability, and administrative feasibility. However, it is also crucially important to consider which approach has the best chance of navigating the historic graveyard for climate legislation—the Senate. Furthermore, while partisanship and the power of vested interests are problems without immediate solutions, Senate processes and procedure appear more malleable. Balancing ambition with pragmatism will require careful political judgement, with the “right” answer emerging from the balance of political power post-2020.

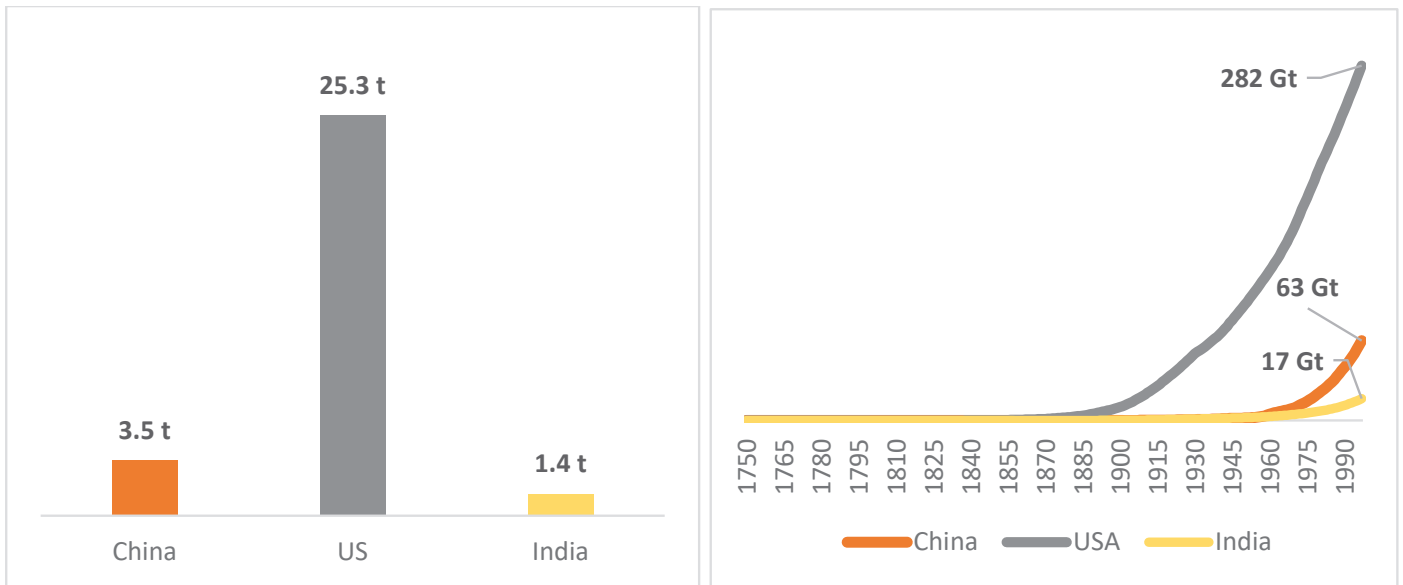
The third lesson is flexibility. When the Obama administration eventually pressed ahead with its plan B—Executive Orders—it was four years after the failure of cap-and-trade legislation. A dual approach, advancing legislation and Executive Orders consecutively, could strengthen a future administration’s negotiation position with Congress, while managing the risk of yet another legislative impasse.

Every year that passes the impacts of climate change become more severe and devastating, and the calls for a political response become louder.

A large majority of Americans want government to do more,⁹¹ and action is a growing concern for registered voters.⁹² Against the backdrop of more sophisticated methods for calculating emissions damages, as well as mounting legal pressure on governments globally to act on climate, the next window of opportunity might be the last chance for the US to act on its own terms. This does not mean that a window of opportunity will inevitably open in 2021, or that if it does, legislation will successfully be advanced. If not, however, the focus may well turn to litigation, and failing that, to history as the final presiding judge.

APPENDIX

Emissions per capita and accumulated emissions for US, India and China in 1997 (CO₂-eq)



Source: Our World in Data (2016) and World Bank (2018)

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4. <https://www.iea.com/publication/the-paris-climate-agreement-versus-the-trump-effect-countervailing-forces-for-decarbonisation/>
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7. <https://www.congress.gov/bill/116th-congress/house-resolution/109/text>
8. <https://www.clcouncil.org/our-plan/>
9. <https://www.edf.org/climate/how-cap-and-trade-works>
10. See next section: this commitment was made by G.W.H Bush, but adopted by President Clinton in more explicit terms
11. <https://unfccc.int/process/the-kyoto-protocol>
12. https://unfccc.int/files/meetings/cop_15/copenhagen_accord/application/pdf/unitedstatescphaccord_app.1.pdf
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21. <https://digitalcommons.law.ggu.edu/cgi/viewcontent.cgi?referer=https://www.google.com/&httpsredir=1&article=1842&context=ggulrev;US>
22. The tax on BTUs (or "British Thermal Units") was effectively an energy tax levied according to the heat content of all heat sources (exempting renewables such as wind, solar and geothermal energy)
23. <https://www.nytimes.com/1993/06/09/us/clinton-backs-off-plan-for-new-tax-on-heat-in-fuels.html> and <https://digitalcommons.law.ggu.edu/cgi/viewcontent.cgi?referer=https://www.google.com/&httpsredir=1&article=1842&context=ggulrev;US>
24. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1567135/pdf/envhper00393-0037-color.pdf>
25. We have chosen to work with gross emissions data throughout, due to the changing accounting rules for LULUCF emissions over the different accounting periods. In other words, we exclude the contribution of carbon sinks such as forestry to US emissions inventories. While the gross figures represented are therefore higher than if the contributions of sinks were included (by 700-900 MT CO₂-eq per annum), this will not materially affect the gap to target calculations.
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85. Massachusetts v EPA <http://climatecasechart.com/case/massachusetts-v-epa/>; An instructive case is American Electric Power Company v. Connecticut, which was decided by the Supreme Court of the United States in April 2011. Eight Federal States sued utility companies that constituted the largest greenhouse gas emitters in the US at the time, alleging public nuisance. The Supreme Court delivered a unanimous opinion that it was not up to the courts to get involved in this matter as Greenhouse Gas Emissions were for the EPA to regulate under the Clean Air Act <http://climatecasechart.com/case/american-electric-power-co-v-connecticut/> .
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