

A member of Prudential plc (UK) 🗍 🗐 🥼





### Searching for a Climate Solution (Part 1): A Short Primer on the Stakes and Prospects for Glasgow

Donald P. Kanak, Chairman, Prudential Insurance Growth Markets

Don Kanak, Chairman of Prudential Insurance Growth Markets, has been engaged in environmental protection and climate change starting from his first job at the United States Environmental Protection Agency in the 1970s. During his extensive career in insurance and investments, Don has chaired the WWF's Global Forest and Climate Initiative, served as a member on the United Nations Global Environment Facility's Technical Advisory Group on its 2014-2018 climate change mitigation strategy, and participated in climate meetings alongside Copenhagen (COP 15, 2009) and Doha (COP 18, 2012).

As we approach what would have been the scheduled date of COP 26 in Glasgow, we asked Don to share his thoughts on the importance of the climate change negotiations, historical challenges, and prospects for Glasgow in this two-part series.

### INTRODUCING THE CHALLENGE

When the Paris Agreement was announced at the 21st Convention of the Parties (COP 21) in 2015, the world celebrated its first binding global agreement. Reaching this milestone took almost 25 years of negotiation amongst developed and developing countries (see Insert 1 – a brief history climate change). However, five years on, greenhouse gas (GHGs) concentrations continue to rise. Without commitments in Glasgow for deeper and faster reduction, the world still faces climate disaster.

Before the Paris Agreement, scientific consensus was that to keep global warming within 2°C by 2100, atmospheric concentration of GHGs must not exceed 450 parts per million (ppm) of  $CO_2e^1$ . The world reached 454 ppm  $CO_2e$  in 2004<sup>2</sup> and has since exceeded that level. (Fig.1) In fact,  $CO_2$  concentrations, which are the largest contributor to GHGs, are now are at the highest level in over 800,000 years<sup>3</sup>.

Source: 'IPCC. (2014). Summary for Policymakers. In: Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Page 10. https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc\_wg3\_ar5\_summary-for-policymakers.pdf <sup>2</sup>NOAA. (n.d.). "The NOAA annual greenhouse gas index (AAGI)". https://www.esrl.noaa.gov/gmd/aggi/aggi.html <sup>3</sup>Lindsey, R. (14 August 2020). "Climate change: Atmospheric carbon dioxide". Climate.gov. https://www.climate.gov/news-features/understanding-climate/climate-change-atmospheric-carbon-dioxide



As the world already overshot the 450ppm  $CO_2e$  threshold, in order to stay within the 2°C warming "carbon budget<sup>4</sup>", annual global GHG emissions need to drop from 55 gigatons of carbon dioxide equivalent (Gt  $CO_2e$ ) in 2018 to 41 Gt  $CO_2e$  by 2030 and zero by 2100<sup>5</sup>. Getting a global agreement to achieve those radical reductions depends on the success of COP 26 in Glasgow scheduled for November 2021.

## WHY IS IT IMPORTANT THAT WE STAY WITHIN 2°C WARMING?

Although the differences may seem small between 1.5°C and 2°C warming by 2100, it poses significant risks to nature as well as human life, health, economic growth, and geopolitical stability. Fig.2 illustrates how if warming exceeds 2°C, the impact on various areas dramatically worsens.

The scientific foundation behind climate change is not recent. In the late 1800s, Swedish chemist Svante Arrhenius predicted that climate change would occur due to changes in physical chemistry in the earth's atmosphere. He calculated that cutting  $CO_2$  in half would produce an ice age, whilst doubling it would warm the planet by 5-6°C<sup>6</sup>.Despite Arrhenius' observation it took almost a century of increasing emissions for the world to forge the United Nations Framework Convention on Climate Change (UNFCCC) in 1992 to agree to work toward controlling emissions and limiting global warming.

Under the framework of the UNFCCC, over the next 20 years, climate scientists (the IPCC), thousands of national and international public sector leaders, and a host of private sector and civil society stakeholders gathered at COPs and a host of related meetings attempting to create a global architecture to rein in GHGs whilst preserving growth. The Kyoto Protocol reached in 1997 was a milestone. It only required specific actions amongst 37 countries and the European Union, however, and it ultimately failed to deliver the expected



### Fig 2: A few examples of impacts of 1.5°C and 2°C warming

Area of impact	1.5°C scenario	2°C scenario			
Population living in cities affected by rising sea levels	137 million	280 million			
Annual losses due to sea level rise related flood damages	USD 10 trillion	USD 12 trillion			
Population exposed to water scarcity	+271 million	+388 million			
Population affected by food insecurity	Not analysed	+189 million			
Population facing at least one severe heatwave every 5 years	14%	37%			
Change in global GDP per capita by 2100	-8%	-13%			
Species loss, e.g. coral reef	70-90% loss	>99% loss			
Source: Carbon Brief; Climate Central; World Food Program; IPCC AR5					

Source: <sup>4</sup>See Insert 2 – Glossary of climate change terminology. <sup>5</sup>United Nations Environment Programme. (2019). Emissions Gap Report 2019. UNEP, Nairobi. Table 3.1. https://www.unenvironment.org/resources/emissions-gap-report-2019 <sup>6</sup>Svante Arrhenius (1896). On the influence of carbonic acid in the air upon the temperature of the ground. Philosophical Magazine and Journal of Science. 41 (251): 237–276. doi:10.1080/14786449608620846.



A member of Prudential plc (UK) 3

results. The Paris Agreement at COP 21 marked the first time virtually all developed and developing countries agreed to binding commitments aimed to limit average global warming to 2°C whilst pursuing efforts to limit warming to 1.5°C<sup>7</sup>.

How did the negotiators at COP 21 achieve a binding agreement that had eluded their predecessors for 20 years? Fundamentally, they were successful because they resolved the previously intractable "Iron Triangle" of climate change negotiations.

### BRIDGING THE GAPS: THE "IRON TRIANGLE" OF AMBITION, EQUITY, AND CAPACITY

From the early COPs in the 1990s including the Kyoto Protocol (COP 3, 1997), through the nearly

successful effort in Copenhagen (COP 15, 2009), negotiators struggled with the same major issues. Those can be summarised along three dimensions of an "Iron Triangle": Ambition-Equity-Capacity.

- Ambition: Both developed and developing countries have to make ambitious efforts to reduce emissions. In 1990, almost 80% GHG emissions were from the developed world<sup>8</sup>, but almost 90% of growth between 2000 and 2018 has been from the developing countries<sup>9</sup>.
- Equity: What is a fair way to share the burden? Specifically, a) How do we allocate reductions across countries? (transnational equity); and b) How to allocate and reduce unequal burdens on populations, providing a "just transition" for groups that will be disproportionately affected?



Source: <sup>7</sup>For more details, please see https://unfccc.int/process-and-meetings/the-paris-agreement/what-is-the-paris-agreement <sup>8</sup>We define "developed countries" here as G20 excluding China and India. <sup>9</sup>We define "developing countries" here as all countries excluding G20 but including China and India. Olivier J.G.J. and Peters J.A.H.W. (2020). Trends in global CO<sub>2</sub> and total greenhouse gas emissions: 2019 report. Report no. 4068. PBL Netherlands Environmental Assessment Agency, The Hague.Olivier J.G.J. and Peters J.A.H.W. (2020). Trends in global CO<sub>2</sub> and total greenhouse gas emissions: 2019 report. Report no. 4068. PBL Netherlands Environmental Assessment Agency, The Hague.



A member of Prudential plc (UK)

Transnational equity has always been a contentious issue between developed and developing countries. What is the "fair" basis to decide emission reduction targets depends on one's perspective (Fig.4). If this is done by current annual emissions, then China would need to cut the most. If this is done by current annual emissions per capita, then high carbon developed countries such as the US, Russia or Australia would have to cut the most. If by historical per capita emissions, then Europe and North America should bear the heaviest burden. Developing countries have much lower current and historical emissions per capita and thus believe it is unfair to be asked to bear extra burden to solve a problem that the developed countries (mostly Europe and North America) created in the past 150 years, especially if cutting emissions will impose growth constraints and prevent millions from escaping poverty.

Capacity: Do we have the means to cut? Many developing countries lack the experience, technology, and finance to develop less carbon intensive energy systems and business models at the pace required to meet the 2°C target. Thus, mechanisms to transfer funds and technology are critical to any climate agreement.





A member of Prudential plc (UK)

COP 21 was able to solve the "Iron Triangle" and forge an agreement by balancing all three factors - Ambition, Equity, and Capacity. Countries were empowered to establish their own "Nationally Determined Contributions" (NDCs) appropriate to their circumstance including their stage of national development (Fig.5).

In addition, to improve Equity and increase the Capacity of developing countries, developed countries agreed to provide \$100 billion annually starting in 2020 to finance climate change mitigation initiatives<sup>11</sup>.

### PARIS WAS GREAT, BUT IT WASN'T ENOUGH

Achieving the NDCs agreed at Paris will not keep warming below 2°C. Best estimates indicate that even if all of the current NDCs are achieved, the

Fig 5: Example Nationally Determined Contributions from various countries<sup>10</sup>

planet will still warm by 2.4 - 2.7°C (Fig.6). At Paris, leaders recognised this shortfall and agreed to reconvene at COP 26 (Glasgow, 2021) to assess progress and to increase the ambition to achieve the 2°C, and, if possible, get closer to 1.5°C.

# THE CONSEQUENCES OF DELAY — RADICALLY STEEPER REDUCTIONS

In the 1990s when the Kyoto Protocol was negotiated, the scientific consensus was that the world could stay within 2°C warming by reducing GHG emissions by 0.5% annually until 2100. (See purple line in Fig.6). Because Kyoto and subsequent COPs failed to rein in emissions growth, however, instead of falling by 0.5% per year, total emissions grew by about 1.5% per year from 1990 to 2018 (see black "historical emissions" line in Fig.6), pushing atmospheric concentrations of GHGs

Country	Example Nationally Determined Contributions
European Union	<ul> <li>Binding target of at least 40% domestic reduction in GHG emissions by 2030 compared to 1990 level</li> <li>Note: The EU is in discussions to raise the target to 55%</li> </ul>
United States	<ul> <li>Reduce its GHG emissions by 26-28% compared to 2005 level in 2025</li> <li>Make best efforts to reduce its emissions by 28%</li> <li>Note: The US formally withdrew from the Paris Agreement in 2020</li> </ul>
China	<ul> <li>Peak carbon dioxide emissions by 2030 and make best efforts to peak early</li> <li>Lower carbon dioxide emissions per unit of GDP by 60-65% relative to 2005 levels by 2030</li> <li>Increase the share of non-fossil fuel in primary energy consumption to around 20% by 2030</li> <li>Increase the forest stock volume by around 4.5 billion cubic meters relative to 2005 levels</li> </ul>
India	<ul> <li>Reduce emissions per unit of GDP by 33-35% relative to 2005 levels by 2030</li> <li>40% of total electric power installed capacity from non-fossil fuel based energy by 2030</li> <li>Create an additional carbon sink of 2.5 – 3 billion tonnes of CO<sub>2</sub>-equivalent by 2030</li> </ul>

Source: <sup>10</sup>UNFCCC. (n.d.). "NDC Registry (interim)". https://www4.unfccc.int/sites/NDCStaging/Pages/All.aspx <sup>11</sup>United Nations Framework Convention on Climate Change. (2016). Report on the Conference of Parties on its twenty-first session, held in Paris from 30 November to 13 December 2015. Addendum. Part two: Action taken by the Conference of the Parties at its twenty-first session. Decision 1/CP.21 paragraph 53. https://unfccc.int/resource/docs/2015/cop21/eng/10a01.pdf



A member of Prudential plc (UK) 🧃 🗐 🥼



from 417 to 496 ppm<sup>12</sup>. Starting from this higher level means that COP 26 in Glasgow must achieve commitments to more drastic reductions to stay within the 2°C or 1.5°C warming targets (see green and blue areas in Fig.6).

Current best estimates indicate that to stay within 2°C warming will require annual global GHG reductions of 2.7% per year until 2100<sup>13</sup>. To put that in perspective, COVID-19's unprecedented impact on economies (especially travel, tourism, and mobility) is projected to reduce 2020's global GHG emissions by 4.6%<sup>14</sup>. This means that we would need the equivalent of a global pandemic effect every other year to keep emissions in line. Can the world really reduce global carbon emissions in such a drastic manner - without a global pandemic's economic damage? This is especially true when many existing business models and national strategies for energy are still reliant on fossil fuels for energy and unsustainable agricultural practices for food.

The above is not to cast gloom on the prospects for success in Glasgow at COP 26. Rather, it seeks to clearly illustrate the enormous challenge that the UK faces as Chair of COP 26 in forging an agreement to achieve the 2°C or better ambition — and how further delays will make the challenge even more daunting, if not impossible.

Upping the ambition and reaching an agreement at Glasgow will require bridging the Iron Triangle once again. If you were setting the odds based on success from the past, 1 win (Paris) in 25 COPs, one might not be optimistic. Some would argue that the crisis of COVID-19 will make success even harder to achieve due to financial stress and diversion of priorities.

Still, there is hope. In Part 2 of this series, we will explore five "winds of change" that working together could fundamentally shift the odds in favour of an ambitious agreement in Glasgow.

Source: <sup>12</sup>NOAA. (n.d.). The NOAA annual greenhouse gas index (AAGI). <sup>13</sup>UN Environment Programme. (26 November 2019). Cut global emissions by 7.6 percent every year for next decade to meet 1.5°C Paris target – UN report. https://www.unenvironment.org/news-and-stories/press-release/cut-global-emissions-76-percentevery-year-next-decade-meet-15degc <sup>14</sup>Lenzen, M., Li, M., Malik, A., Pomponi, F., Sun, Y-Y, Wiedmann, T., et al. (2020) Global socio-economic losses and environmental gains from the Coronavirus pandemic. PLoS ONE 15(7): e0235654. https://doi.org/10.1371/journal.pone.0235654



# Insert 1: A brief history of climate change

KE	Y EVENTS	ANNUAL GHG EMISSIONS (GTCO <sub>2</sub> E)	CO <sub>2</sub> E PPM
0	<b>1896:</b> Svante Arrhenius calculated that cutting $CO_2$ in half would produce an ice age, whilst doubling it would warm the planet by 5-6°C	n/a	~300
0	<b>1988:</b> The Intergovernmental Panel on Climate Change (IPCC) was established by the United Nations Environment Programme and the World Meteorological Organization. It aims provide governments at all levels with scientific information that they can use to develop climate policies.	35	410
0	<b>1990:</b> IPCC releases their First Assessment Report. The report underlined the importance of climate change as a challenge with global consequences and requiring international cooperation.	37	417
0	<b>1992:</b> IPCC releases the Supplementary Report to the First Assessment Report to contribute to the debate on the United Nations Framework Convention on Climate Change (UNFCCC) at the 1992 Earth Summit in Rio de Janeiro.	38	421
0	<b>1995:</b> The Conference of Parties (COP), which is the supreme decision-making body of the United Nations Framework Convention on Climate Change, held its first meeting in Berlin	39	428
0	<b>1997:</b> COP 3 was held in Kyoto, resulting in the world's first legally binding treaty to reduce greenhouse emissions – the Kyoto Protocol. The Kyoto Protocol sets binding emission reduction targets for 37 industrialized countries and the European Union.	42	432
9	<b>2009:</b> COP 15 was held in Copenhagen. The Copenhagen Accord was not legally binding.	49	465
Q	<b>2012:</b> The end of the Kyoto Protocol's first commitment period.	52	474
0	<b>2015:</b> COP 21 was held in Paris, resulting in the first-ever universal, legally binding global climate change agreement – the Paris Agreement. The Paris Agreement aims to keep the increase in global average temperature by 2100 to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5°C.	54	490
0	2021: COP 26 will be held in Glasgow.	?	?



## Insert 2: Glossary of climate change terminology

**Cap and trade:** An emission trading scheme whereby businesses or countries can buy or sell allowances to emit greenhouse gases via an exchange. The volume of allowances issued adds up to the limit, or cap, imposed by the authorities.

**Carbon budget:** The amount of carbon dioxide emissions permitted over a period of time to keep within a certain temperature threshold.

**CBDR:** Common but differentiated responsibilities and respective capabilities. A principle of international environmental law establishing that all states are responsible for addressing global environmental destruction yet not equally responsible.

**CO<sub>2</sub>e:** Carbon dioxide equivalent. It describes, for a given mixture and amount of greenhouse gases, the amount of  $CO_2$  that would have the same global warming ability.

**COP:** Conference of the Parties. The supreme decision-making body of the United Nations Framework Convention on Climate Change. It currently meets once a year to review the Convention's progress.

**ETS:** Emission Trading Scheme. A scheme set up to allow the trading of emissions permits between business and/or countries as part of a cap and trade approach to limiting greenhouse gas emissions.

**EUA:** EU Allowance Unit. A tradable unit under the European Union Emissions Trading Scheme (EU ETS), giving the holder the right to emit one tonne of carbon dioxide equivalent gas.

**GHG:** Greenhouse gases. The atmospheric gases responsible for causing global warming and climate change. The major greenhouse gases are carbon dioxide ( $CO_2$ ), methane ( $CH_4$ ), and nitrous oxide ( $N_2O$ ). Less prevalent, but very powerful, GHGs are hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride ( $SF_6$ ).

Gt: Gigaton. A billion metric tonnes.

**GWP:** Global Warming Potential. As greenhouse gases have varying abilities to absorb heat and warm the atmosphere over a given time period, GWP equalizes their warming strength relative to carbon dioxide. For example, carbon dioxide has a GWP of 1, whilst methane has a GWP of 25 over 100 years. It is important to know the timescale, as gases are removed from the atmosphere at different rates.

**IPCC:** The Intergovernmental Panel on Climate Change. A scientific body established by the United Nations Environment Programme and the World Meteorological Organization in 1988. It reviews and assesses the most recent scientific, technical, and socio-economic work relevant to climate change, but does not carry out its own research.

MRV: Monitoring, reporting and verification.

**NDC:** Nationally Determined Contribution. Submissions by countries that have ratified the Paris Agreement which presents their national efforts to reach the Paris Agreement's long-term temperature goal of limiting warming to well below 2°C. New or updated NDCs are to be submitted in 2020 and every five years thereafter. NDCs thus represent a country's current ambition/ target for reducing emissions nationally.

ppm or ppmv: parts per million by volume.

**UNFCCC:** The United Nations Framework Convention on Climate Change. One of a series of international agreements on global environmental issues adopted at the 1992 Earth Summit in Rio de Janeiro. It aims to prevent "dangerous" human interference with the climate system.

#### Disclaimer

#### This document is produced by Eastspring Investments (Singapore) Limited and issued in:

**Singapore and Australia (for wholesale clients only)** by Eastspring Investments (Singapore) Limited (UEN: 199407631H), which is incorporated in Singapore, is exempt from the requirement to hold an Australian financial services licence and is licensed and regulated by the Monetary Authority of Singapore under Singapore laws which differ from Australian laws.

Hong Kong by Eastspring Investments (Hong Kong) Limited and has not been reviewed by the Securities and Futures Commission of Hong Kong.

**Indonesia** by PT Eastspring Investments Indonesia, an investment manager that is licensed, registered and supervised by the Indonesia Financial Services Authority (OJK).

Malaysia by Eastspring Investments Berhad (531241-U).

This document is produced by Eastspring Investments (Singapore) Limited and issued in Thailand by TMB Asset Management Co., Ltd. Investment contains certain risks; investors are advised to carefully study the related information before investing. The past performance of any the fund is not indicative of future performance.

**United States of America** (for institutional clients only) by Eastspring Investments (Singapore) Limited (UEN: 199407631H), which is incorporated in Singapore and is registered with the U.S Securities and Exchange Commission as a registered investment adviser.

**European Economic Area (for professional clients only) and Switzerland (for qualified investors only)** by Eastspring Investments (Luxembourg) S.A., 26, Boulevard Royal, 2449 Luxembourg, Grand-Duchy of Luxembourg, registered with the Registre de Commerce et des Sociétés (Luxembourg), Register No B 173737.

**United Kingdom (for professional clients only)** by Eastspring Investments (Luxembourg) S.A. - UK Branch, 10 Lower Thames Street, London EC3R 6AF.

**Chile (for institutional clients only)** by Eastspring Investments (Singapore) Limited (UEN: 199407631H), which is incorporated in Singapore and is licensed and regulated by the Monetary Authority of Singapore under Singapore laws which differ from Chilean laws.

The afore-mentioned entities are hereinafter collectively referred to as **Eastspring Investments**.

The views and opinions contained herein are those of the author on this page, and may not necessarily represent views expressed or reflected in other Eastspring Investments' communications. This document is solely for information purposes and does not have any regard to the specific investment objective, financial situation and/or particular needs of any specific persons who may receive this document. This document is not intended as an offer, a solicitation of offer or a recommendation, to deal in shares of securities or any financial instruments. It may not be published, circulated, reproduced or distributed without the prior written consent of Eastspring Investments. Reliance upon information in this posting is at the sole discretion of the reader. Please consult your own professional adviser before investing.

Investment involves risk. Past performance and the predictions, projections, or forecasts on the economy, securities markets or the economic trends of the markets are not necessarily indicative of the future or likely performance of Eastspring Investments or any of the funds managed by Eastspring Investments.

Information herein is believed to be reliable at time of publication. Data from third party sources may have been used in the preparation of this material and Eastspring Investments has not independently verified, validated or audited such data. Where lawfully permitted, Eastspring Investments does not warrant its completeness or accuracy and is not responsible for error of facts or opinion nor shall be liable for damages arising out of any person's reliance upon this information. Any opinion or estimate contained in this document may subject to change without notice.

Eastspring Investments (excluding JV companies) companies are ultimately wholly-owned/indirect subsidiaries/associate of Prudential plc of the United Kingdom. Eastspring Investments companies (including JV's) and Prudential plc are not affiliated in any manner with Prudential Financial, Inc., a company whose principal place of business is in the United States of America or with the Prudential Assurance Company, a subsidiary of M&G plc (a company incorporated in the United Kingdom).



Bangkok | Chicago | Ho Chi Minh City | Hong Kong | Jakarta | Kuala Lumpur | London | Luxembourg | Mumbai | Seoul | Shanghai | Singapore | Taipei | Tokyo