



United Nations
Framework Convention on
Climate Change

2016 United Nations Climate Change Conference (COP22/CMP12)

Thunder Bay, Canada

Background and Briefing Notes (for March 18, 2016)

This exercise in Geog. 3331 provides a brief history of world positioning and a framework of geopolitical considerations likely to affect progress in the critical area of climate change negotiations. The goal is to simulate a global discussion of climate change policy with **Multilateral Negotiations** between **Parties** (in this context - countries represented by students in the classroom).

There is an overwhelming scientific consensus that the major cause of global warming is an increase of greenhouse gases such as carbon dioxide and methane from human activities. This enhancement of the "greenhouse effect", where heat radiated by the Earth is absorbed and sent back to the surface by the greenhouse gases in the atmosphere, has resulted in a substantial rise in the average global temperature. The current average is 1.5° C higher than the estimated global temperature in pre-industrial times, which means considerably more energy available in the hydrological cycle and other processes.

More frequent storms, hotter summers and an increase in flooding have driven up the global insurance industry's [annual weather-related losses to \\$200B a year](#) according to Lloyd's of London – a fourfold increase in 30 years. Zurich Re and the Canadian Insurance Board (for Canada 4x) have similar estimates.

The United Nations Framework Convention on Climate Change (UNFCCC) was adopted unanimously at a Rio de Janeiro conference in 1992 (the "Rio Earth Summit"). The Convention committed to stabilize greenhouse gas concentrations "at a level that would prevent dangerous anthropogenic interference with the climate system" and put the onus on developed countries to lead the way. More information about the UNFCCC:

http://unfccc.int/essential_background/convention/items/6036.php

In 1995, the UNFCCC began major annual world meetings, known as "Conference of the Parties" (COP), in Berlin, Germany (COP 1). The "Parties" include almost all of the Earth's nations (Parties). Last December 195 met for two weeks in December 2015. Paris, France was the site of COP 21, the 21st time for this specific type of world meeting.

The following site can be used to refresh your memory of the Agreement reached in Paris:

<http://unfccc.int/2860.php>



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COP 22

The twenty-second session of the Conference of the Parties (COP) and the twelfth session of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (CMP) takes place during March 2016, in Thunder Bay, Canada.

Yes, it is a simulation and a tiny version of what takes place at these annual climate policy conferences. We will mimic some of the discussion, negotiation and bargaining processes that take place at these events. The purpose of these sessions is to facilitate discussion and achieve a mutually agreeable solution to the environmental challenges facing this planet. Of course, a simultaneous goal is to acquaint those taking part with a better understanding of climate change processes, risk management and a glimpse of some of the complexity of geopolitics that take place

Dear Leaders and Advisors,

Welcome to the 2016 UNCCC COP22/CMP12. Your hosts are the Department of Geography and the Environment of Lakehead University and the Chairs of each Session. We thank UNFCCC and Lakehead University and acknowledge their support.

Schedule of events

- 1) **Registration** This takes place prior to Session 1. Party Delegates are requested to display person name and Party identification on the conference table for the duration of the conference.
- 2) **Welcoming Address** (Friday, March 18, 8:30 am) – Graham Saunders
- 3) **Address from the Session Chair:** Dr. Rob Stewart
- 4) **Position Statements** (Friday, March 18, 8:40 am) – The delegates are invited to address the conference with a statement of their position with respect to climate change and efforts for mitigation. This statement may have emerged from meetings with Non-Governmental-Organizations (NGOs), corporations, and private citizens from the home country in order to have forged a common national plan for carbon emission reduction. Given the number of Parties and the limited amount of time available for statements, it will be necessary to limit the duration of each statement and in fairness to all speakers, time limits will



be strictly enforced, Parties are reminded that statements made by Leaders should not exceed the three-minute limit.

- 5) **Multilateral Negotiations** (March 18, 9:10 am) – Once each nation has presented its plan for carbon emissions, the initial round of bargaining will begin. As you are aware, any agreement on emissions reductions will be made multilaterally between nations. Policy makers are allowed and encouraged to call on technical advice from experts on hand. A few people with expertise will be present. This technical advice may include various subjects and processes likely to be influenced by changing climate(s) and could include climate change science, forestry, agriculture, human health, previous outcomes of previous COP events and so on.
- 6) The second session takes place two weeks later.

Multilateral Negotiations (March 18 and 30) – Provisions have been made for a further round of bargaining in the event that an agreement cannot be reached during the initial negotiations. (Please also consult the documents on climate ethics on the conference website.)

- 1) **Conference Conclusion** (Wednesday, March 30, 9:45 am)

Delegations Attending Conference:

Alliance of Small Island States (AOSIS) Nicole Distranski

Australia Brittany Moses

European Union Sweden - Eric Bongelli; Germany - Kevin Bonden

Canada Brandon Hanson

China Aysha-Liisa McNally

India Curtis Towle

Japan Brian Hicks

New Zealand Danielle Duplisea,

Russia Dalton Sparks

Less Developed Countries (LDCs)

United States Alyssa Grace

This site may add some guidance to our present COP:



http://unfccc.int/files/meetings/paris_nov_2015/application/pdf/paris_agreement_next_steps_post_adoption.pdf

Discussion

The following article (and summary) "*The geographical distribution of fossil fuels unused when limiting global warming to 2 °C*" by Christophe McGlade and Paul Elkins (Nature 517, 187–190, 08 January 2015) estimates the fossil fuel resources that can be used if the objective is to keep the global temperature increase to 2° C above the pre-industrial temperature. They estimate what portion of coal, oil and natural gas resources recoverable under current economic conditions can ultimately be utilized and the converse – what would remain untouched in the ground or beneath the sea.

To have a 50 per cent chance of keeping temperature increases to below 2° C, the remaining global "carbon budget" is approximately 1100 gigatons (Gt CO₂) of carbon dioxide. Fossil fuel resources are nearly 11,000 Gt CO₂) and reserves are nearly 2,900 Gt CO₂.

If carbon capture and sequestration (CCS) is extensively used from 2025 onwards, over 430 billion barrels of oil and 95 trillion cubic metres of gas reserves would have to stay in the ground. This translates in half of the oil in the Middle East, and a 75 per cent of Canada's oil reserves, mainly bitumen in the Alberta Oil/Tar Sands. About 82 per cent of coal reserves would need to remain unburned. The United States, Russia plus the former Soviet Union would be able to use less than 10 per cent of their reserves.

If CCS is not widely used, utilization of current fossil fuel reserves must be lower. With unconventional oil, natural bitumen utilization in Canada must become "negligible" by 2020, and without CCS, all bitumen production must cease by 2040. Unconventional (mainly fracking) natural gas fares better because of displacing coal in electric and industrial sectors, permitting 50 trillion cubic metres to be burned. However, by 2050, 80 per cent of unconventional gas resources in China, India, Africa and the Middle East must remain unburned.

Text box: Carbon vs carbon dioxide

The terms "carbon" and "carbon dioxide" are often confused and incorrect calculations will be wrong by a large factor: 3.67. Some people use carbon in the atmosphere rather than carbon dioxide. (There are reasons for use of either but this is not part of this discussion.) The atomic weight of carbon is 12 atomic mass units, while the weight of carbon dioxide is 44, because it includes two oxygen atoms that each weigh 16. So, to switch from one to the other, use the formula: One tonne of carbon equals $44/12 = 11/3 = 3.67$ tonnes of carbon dioxide. Thus 11 tonnes of carbon dioxide equals 3 tonnes of carbon, and a price of \$30 per tonne of carbon dioxide equals a price of \$110 per tonne of carbon.



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In 2014, global carbon (C) emissions from fossil fuel use were nearly 10 gigatonnes (Gt), or 36.7 GtCO₂ of carbon dioxide. If this rate is maintained (no reduction or increase) for 30 years the carbon budget mentioned above is exhausted in the year 2045.

The time period 2045 to 2050 used to be the estimate when world would reach 2° C above the pre-industrial temperature. Climate scientist Dr Michael Mann, in Scientific American in March 2014, warned the world could be 2° C warmer in as little as two decades. Mann says that new calculations "indicate that if the world continues to burn fossil fuels at the current rate, global warming will rise to 2° C by 2036". To avoid this threshold "nations will have to keep carbon dioxide levels below 405 parts per million" now and with major reductions in the near future.

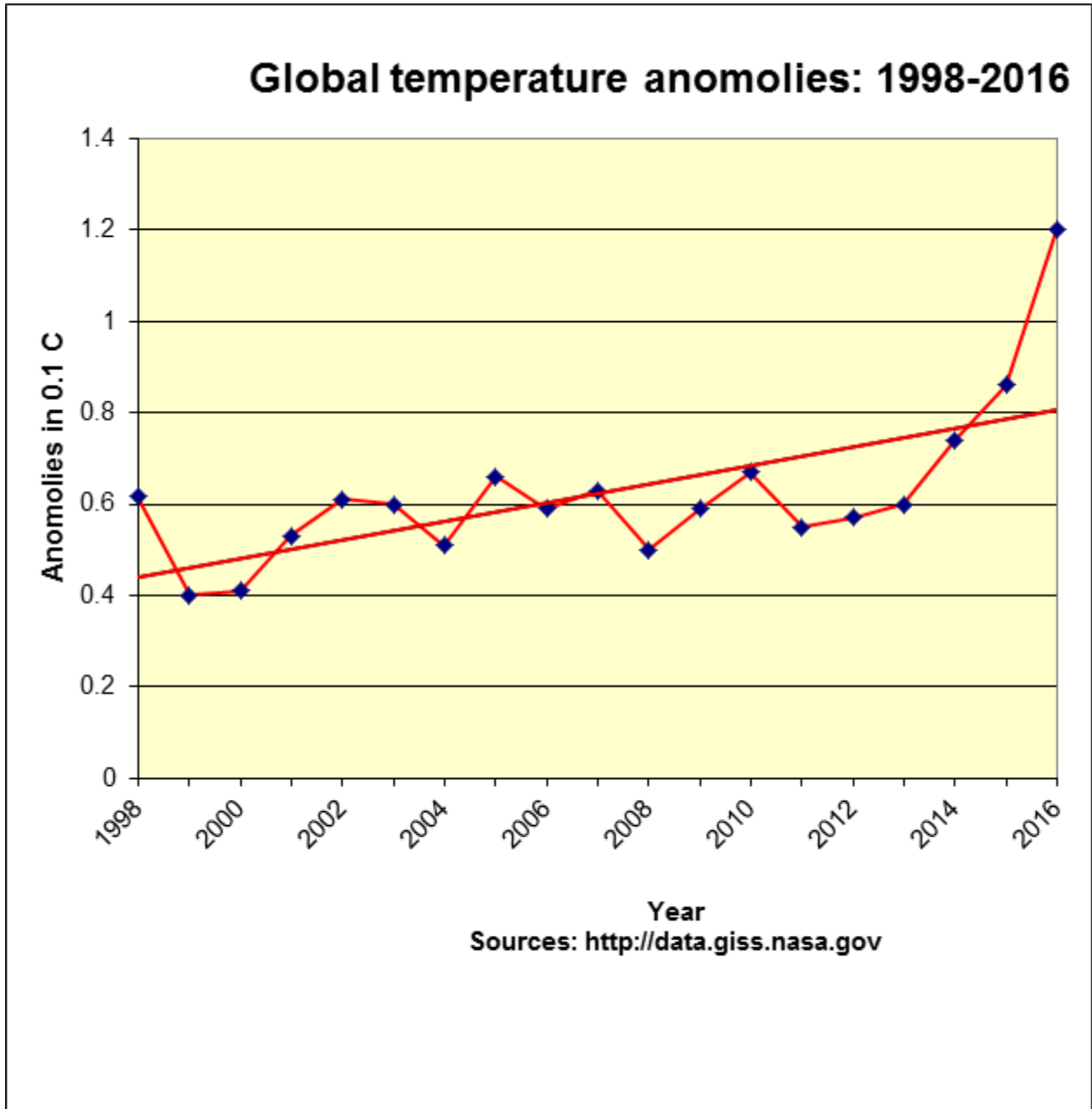
Michael Mann may have been optimistic about the timing!

Another global heat record was set in February with an anomaly of 1.35° C above the average temperature of 1951 to 1980 of 14.0° C. Readers almost certainly know that at the global scale this confirms a gain of considerable heat energy – enough to melt vast expanses of ice, thaw permafrost, change ocean volumes and accelerate the frequency of severe weather events

Records have been set every month since last September. December's global average temperature was 15.1° C, January's was 15.13° C and February's 15.35° C. The global temperature last month was 0.5° C warmer than six months ago, which implies a present global temperature average temperature of 1.7° C above the pre-industrial temperature.

It is not just temperatures rising. The atmospheric carbon dioxide level recorded at Mauna Loa, Hawaii reached 404 parts per million, 4 ppm higher than the previous record set one year ago.

"Unfortunately one cannot simply change the weather or nicely ask Mother Nature to cheer up", the words of a student (BL) commenting on adaptation to urban and regional flooding.



Notes:

- The data point for 2016 is obviously based on only two months and could level out or even decline to 1.1 or 1.0.
- The above figure displays anomalies in comparison to the global mean for 1951-1980, i.e. 14.0° C. This is not the pre-industrial global temperature which is estimated to be 13.6° C in 1800 or 13.7° C for the 1800s to about 1920.
- In other words, it is possible the global temperature of 15.1° C in December was at 1.5° C above the pre-industrial temperature as Canada and



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almost all other countries signed the Paris Agreement that acknowledged that this was a dangerous threshold and spoke about not exceeding this in the future.

- The year of 1998 was selected to confirm how much the global temperature has increased since the previous major El Niño.
- 1998, the warmest year in the instrument record to that time, was used by those promoting fossil fuel usage as a baseline to claim things like the world is getting cooler, greenhouse gases may rescue us from an ice age, scientists are wrong, as so on.

Climate change has been termed a “wicked problem” by some. Stephen Gardiner describes it as “a perfect moral storm”. (A Perfect Moral Storm. The Ethical Tragedy of Climate Change. Oxford: Oxford University Press 2012). To date, changes in climate policy has been limited and mainly ineffectual at the world level.

All countries should act on climate change policy and regulation because the weather-related losses noted above are likely just a preview and climate scientists, economists and policy makers warn of “tipping points”. Effects of climate change range from gradual and easily dismissed, to tipping points at which catastrophic and irreversible regime shifts could be triggered.

However, it may not be in a country’s individual interest to act, especially if there is no guarantee that other countries will also act; hence be “free-riders”. Making a deal to tackle climate change involves conciliating individual and collective incentives. It also involves negotiating issues associated with inequality, uncertainty and tipping points.

Conference of the Parties (COP) and, because this is 21st time for these specific world meetings, this time it has the short form COP 21. The “Parties” include almost all of the Earth’s nations, about 195 now.

The United Nations Framework on Climate Change Conference (UNFCCC) was discussed and created that Rio Earth summit in 1992. The first COP took place in Berlin, Germany in 1995. The process has a history but almost no success on the earlier goal of stabilising atmospheric concentrations of greenhouse gases (GHGs) to avoid “dangerous anthropogenic interference with the climate system.”

There has been a pattern to these previous 20 meetings. They feature optimism and despair, agreement and anger condensed into a manic two weeks. They start slowly and hopeful talk happens at the meet and greet and in the early days. Later in the first week the language gets tougher as the fundamental differences crystallise. A variety of accusations are made and delegations from some countries or whole alliances of nations threaten to leave early in the second week. Various media announce “climate deal on the brink of collapse”.



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Finally, if there is a final caveat in the complexity of climate change policy, just a modest amount of investment will not guarantee avoidance of dangerous climate change. A large enough commitment is needed to avoid tipping points and less could result in catastrophic outcomes.

Perhaps the greatest barrier to international climate negotiations is inequality. There are conflict between rich and poor countries (and within countries), and between major emitters and those that emit much less

1998, the Kyoto Protocol, which establishes targets to reduce greenhouse emissions, brought some hope that this could be possible. But 18 meetings and 192 countries' signatures later, still only a handful of nations are following its directives. A clear obstacle is the fact that the risk of climate catastrophe is (wrongly) perceived as low, since it is far in the future.

Framework for the negotiations

Globally, there are currently 1000 units of total carbon emitted on a yearly basis. As agreed at COP15/CMP5 Copenhagen, an 80% reduction of carbon emissions globally is required in order to avoid a global temperature increase of two degrees Celsius, the threshold above which damage to the planet is expected to be “catastrophic” for people and other species. In other words, global emissions need to be reduced from the present 1000 units to 200 units to avoid this.

Using information in the tables of Intro: Climate Change and Geopolitics

As at previous Conferences of the Parties (COP), we anticipate that there will be some disagreement regarding the international distribution of emissions reductions. For example, arguments have been made that developed nations should cut more as they have historically produced more. Furthermore, developed nations are in a better position to bear the economic costs associated with emissions reductions, which can be substantial (for example, restricting oil sands production could cause a substantial reduction in Canada’s gross domestic product). Others have called for the biggest producers to cut more as this will have a larger impact in reducing carbon emissions. Yet, many of the largest producers are or are projected to be developing nations and leaders of these nations have objected that cutting emissions would necessarily hinder the economic and social development of their countries, preventing their citizens from enjoying a standard of living comparable to that taken for granted by the citizens of developed nations. We recognize that carbon emission reductions come at an economic and social cost, but a failure to reduce global emissions also imposes substantial costs on us all. Each nation must therefore decide upon a level of reductions that suits it best, while still contributing to the global solution.



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Calculate the reduction your Party needs to accomplish to comply with the Agreement reached at COP15/CMP5 Copenhagen. Using other information including the Tables in the Intro and the repeated in Appendix 3 below to negotiate and bargain with other Parties at the Table.

Appendix A A brief history of CO₂ research and modelling

The Swedish chemist Svante Arrhenius in 1896 did the first calculations of how much the world would warm if the content of carbon dioxide in the atmosphere was increased. His work suggested that doubling the amount of carbon dioxide (2 x CO₂) in the atmosphere would increase the Earth's average temperature by 3 to 4° C. He also detailed the distribution of temperature rise. The most warming would take place in the high latitudes, medium warming in the mid-latitudes and less in the tropics. These details in part were based on the likely reduction of albedo because of less ice and snow cover in the higher latitudes.

In 1956 the Canadian physicist Gilbert Plass reconfirmed the effect of increasing carbon dioxide on global temperatures in "The Carbon Dioxide Theory of Climatic Change"

<http://onlinelibrary.wiley.com/doi/10.1111/j.2153-3490.1956.tb01206.x/abstract>

Plass predicted further warming: "In contrast with other theories of climate, the CO₂ theory predicts that this warming trend will continue, at least for several centuries." He calculated that 2 x CO₂ scenario would result in a global temperature increase of 3.6° C (in comparison to the year 1800). Plass discussed the sources and sinks for carbon dioxide in the atmosphere and ocean acidity as a consequence of increasing CO₂. In a book published by the Massachusetts Institute of Technology in 1970, "Man's impact on the global environment", a group of eminent atmospheric scientists predicted that increases in carbon dioxide would lead to warming of about 0.5° C by the year 2000 (the world warmed by 0.45° C).

Appendix B. Multilateral Negotiations

Each nation will submit their proposed emissions reduction target. For every unit of carbon cut, UN economists predict that the global economy will grow by \$2 billion by 2100. Hence, if 800 carbon units are cut, the global economy will grow by \$1,600



billion by 2100. This is growth in the global economy as a whole, not in any one country in particular. This growth will be divided equally among the countries of the world. However, for every carbon unit that a country keeps producing (i.e., does not cut), its specific national economy will grow by \$1 billion by 2100.

For example, suppose there are ten countries in the world and one of them is Country A. Country A produces 100 carbon units and chooses to cut 60 carbon units. The UN economists predict that the 60 units cut will contribute to \$120 billion (60 carbon units x \$2 billion / unit) in global growth by 2100. This growth will benefit Country A by \$12 billion (\$120 billion / 10 countries). Conversely, the 40 carbon units that Country A continues to produce will directly add \$40 billion (40 carbon units produced x \$1 billion / unit) to Country A's economy alone. Each country must, therefore, decide between cutting emissions which benefits all, but are distributed globally, and continuing to produce emissions, which only benefits the producing nation.

After each country submits its proposed reductions, our economists will calculate the predicted increase in each country's economy by 2100. Based on these calculations, countries may wish to revise their proposals in subsequent rounds of the negotiations. Given previous failures to reach a suitable agreement, it is anticipated that it may take several rounds of negotiations before a workable agreement is reached, if at all.

Appendix C. Annual Emissions in 2013

Table 2 from the Intro is repeated below.

Table 2 Annual Emissions in 2013: Million tonnes (MT) and Percent of World Emissions

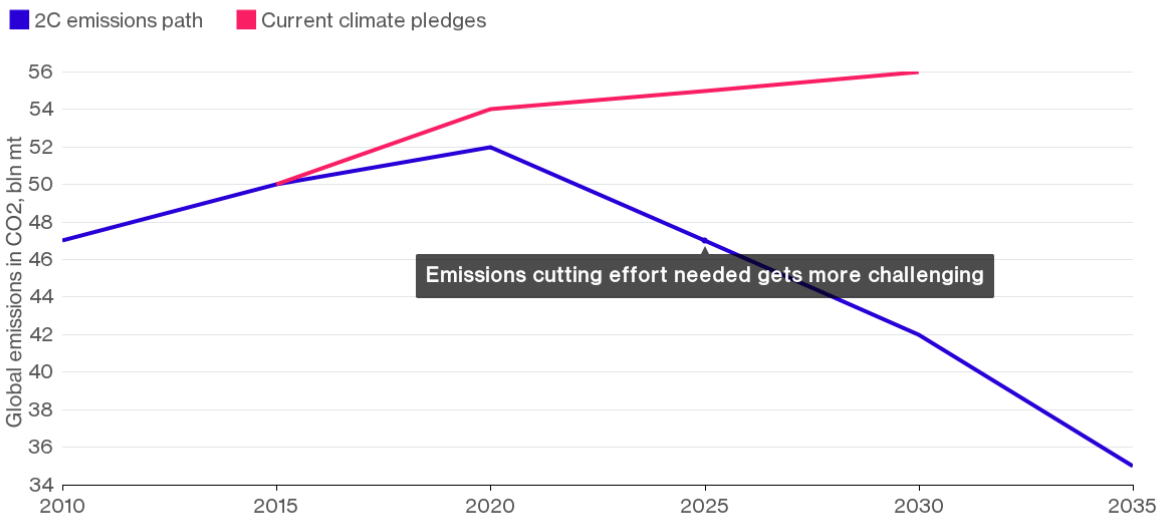
1. China:	9697 MT	28.6%
2. US:	5420 MT	16.0%
3. India:	1967 MT	5.8%
4. Russia:	1829 MT	5.4%
5. Japan:	1243 MT	3.7%
6. Germany:	810 MT	2.4%
7. South Korea:	609 MT	1.7%
8. Canada:	555 MT	1.6%



- 9. Indonesia: 490 MT 1.4%
- 10. Saudi Arabia: 464 MT 1.4%

Global Emissions Targets Remain Inadequate

Nations' carbon-cutting plans won't keep temperatures rising above 2C



Source: UN Environment Programme

Bloomberg



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