

In [a letter](#) dated June 2 sent to the MIT Community entitled, “Letter regarding US withdrawal from Paris climate agreement,” MIT President, Professor L. Rafael Reif criticized the decision taken by President Donald Trump to exit the Paris Agreement. In the following rebuttal of Professor Reif’s letter, we seek to clarify the state of scientific understanding of climate. We do so in order to dispel the popular delusions that we are faced with a problem of dangerous manmade global warming, and that the Paris Agreement would be beneficial.

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1. “Yesterday, the White House took the position that the Paris climate agreement – a *landmark effort to combat global warming by reducing greenhouse gas emissions* – was a bad deal for America.” [Emphasis added to correspond to our comment.] Reif (2017).

To the best of our knowledge, there is no scientific basis unambiguously establishing that CO<sub>2</sub> is the main driver of the modest temperature increase observed since the end of the Little Ice Age. In fact, quite the opposite has been demonstrated numerous times over. For example, ice cores analyses have clearly [revealed](#) that the variation in the concentration of CO<sub>2</sub> followed rather than preceded temperature changes. During the last deglaciation, [the latest high-resolution records](#) show atmospheric CO<sub>2</sub> lagging temperature by 50 to 500 years. Temperature variations would thus appear to be responsible for changes in CO<sub>2</sub> concentrations, not the other way around.

The observation that the changes in the concentration of atmospheric CO<sub>2</sub> followed variations in temperatures even holds true on a decadal time scale, as demonstrated by [Professor Ole Humlum and colleagues](#), including the new study by one of us ([Harde 2017](#)). The time lag in this case is on the order of [8 to 11 months](#). In addition, the growth rate of the atmospheric CO<sub>2</sub> has been [slowing down recently possibly linked to an enhanced terrestrial biosphere uptake](#). As for the human contribution to atmospheric CO<sub>2</sub>, it is indistinguishable from natural fluctuations and the available data provide no basis for determining whether or not it has any marginal influence on climate.

The professor's assertion that global temperatures can be controlled by an international agreement on human-originated carbon dioxide emissions is, therefore, at odds with scientific knowledge on cause and effect. His assertion is, moreover, at odds with its own logic, given that under the Paris Agreement human CO<sub>2</sub> emissions are likely to continue increasing strongly as China and India continue to industrialize.

The Paris agreement lacks binding and enforceable obligations. How could it be otherwise? No nation is forced to fulfil its promised greenhouse gas reduction quota, and many—including Germany and Denmark, the leaders in renewable energies—now appear unlikely to meet them. The Paris agreement is, in practice, a political tool for suppressing growth and redistributing wealth. Mr. Pachauri, former chairman of the IPCC, clearly spelled out that aim, and Ms. Figueres, executive secretary of the UN Framework Convention on Climate Change 2010-2016, insisted: “that it was not about climate but that, for the first time, they had the tools to destroy capitalism.”

## 2. “*The scientific consensus is overwhelming.*” Reif (2017).

The late Michael Crichton described the long-standing understanding of the relationship between science and a consensus of opinions during one of his lectures ([Caltech Michelin Lecture 2003](#)) as follows: “*In science consensus is irrelevant. ... There is no such thing as consensus science. If it's consensus, it isn't science. If it's science, it isn't consensus. Period.*” Doubt is the essence of science. Consensus is a political notion.

Worth considering is the nature of the alleged consensus. It is nothing more than an agreement that temperatures have generally increased since the end of the Little Ice Age. That agreement among most scientists glosses over the fact that the amount of any warming is a matter of heated debate among climatologists. Moreover, measuring global temperature is a statistical exercise that is subject to errors, biases, missing data, judgmental adjustments, and so on.

The estimation of global average temperature from satellite data is relatively new, and employs a completely different temperature measurement method from the older methods. Nevertheless, the satellite data and balloon data have provided essentially identical estimates. Neither displays a worrying trend and both are increasingly at odds with the alarming

projections of the computer climate models relied upon by the UN's Intergovernmental Panel on Climate Change (IPCC).

Scientists also agree that climate changes. It has done so since Earth has had an atmosphere. Scientists will, and do, disagree on causes of climate changes, however; including the mild warming since the Little Ice Age. [Legates et al. \(2015\)](#), for example, found that only 0.3% of 11,944 peer-reviewed articles on climate and related topics, published between the years 1991 to 2011, explicitly stated that the recent global warming was primarily due to man-made generation of greenhouse gases.

3. “As human activities emit more greenhouse gases into the atmosphere, *the global average surface temperature will continue to rise*, driving rising sea levels and extreme weather.” Reif (2017).

During the past 20 years, humans have released over a third of all the CO<sub>2</sub> produced since the beginning of the industrial period. The global average surface temperature has remained essentially constant over this period, a fact that has been acknowledged by the IPCC, whose models failed to predict it.

The climate models that are relied upon by the IPCC and the politicians they advise [projected temperature increases that have been greater than the measured data by at least a factor of 2](#). The increase in global average temperature projected by the models for the period 1990 to 2016 was around 0.75 °C. The measured values from the satellite data are 0.36 (RSS) and 0.32 (UAH), and the land-based observations average 0.48 °C. [Green and Armstrong \(2014\)](#) conducted longer-term validation tests of the IPCC projection models and found that forecasts from them were much less accurate than assuming temperatures would not change. The relative inaccuracy of the IPCC projections increased with [longer \(multi-decadal\) horizons](#). Even forecasts of natural global cooling at a rate of 1 °C per century were much more accurate over long horizons than the IPCC projections of dangerous manmade global warming.

Ten years ago, former U.S. Vice President and global warming alarmist Mr Gore claimed that global temperatures had reached a dangerous “tipping point” with extreme warming imminent and unavoidable. Scientific forecasting pioneer, Wharton Professor Scott Armstrong,

challenged Mr Gore to a ten-year bet based on the [Green-Armstrong-Soon \(2009\) scientific no-change forecast](#) of global mean temperatures. Mr Gore declined the bet, but [theclimatebet.com](#) website keeps track of how the bet would have turned out. With the ten-year life of the bet due to end at the end of this year, the cumulative monthly error of Mr. Gore's assumed forecast of the IPCC's business-as-usual 0.3 °C per decade projection is 22% larger than the error from the no-change forecast.

We ask: why hasn't the dangerous manmade global warming hypothesis been discarded when it is so at odds with the observations?

4. "As human activities emit more greenhouse gases into the atmosphere, the global average surface temperature will continue to rise, *driving rising sea levels* and extreme weather." Reif (2017).

The average sea level rise since 1870 has been in the range of 1.3 to 1.5 mm (0.05 to 0.06 of an inch) per year. Professor Nils-Axel Mörner, a renowned sea-level researcher who has published over 500 peer-reviewed articles on this topic, has been unable to find observational evidence that supports the projections of [dramatically accelerating sea level rise](#) from the climate models relied upon by the IPCC.

5. "As human activities emit more greenhouse gases into the atmosphere, the global average surface temperature will continue to rise, driving rising sea levels and *extreme weather*." Reif (2017).

Observations over the last few decades indicate [that extreme events, including tornadoes and hurricanes, have been decreasing, rather than increasing](#), both in number and in intensity. Moreover, the [total accumulated cyclonic energy](#) has also been declining. As MIT Emeritus [Professor Richard Lindzen](#) has [explained](#), the phenomenon is a consequence of reduced temperature differentials between the tropics and exo-tropics that arise when global average temperatures are warmer.

6. “As the Pentagon describes it, climate change is a “threat multiplier”, because its direct effects intensify other challenges, *including mass migrations and zero-sum conflicts over existential resources like water and food.*” Reif (2017)

Milder temperatures and increased CO<sub>2</sub> levels have been associated with a greener planet, not a browner one. Deserts are retreating and vegetation cover has increased over recent decades. The [production of maize, wheat, rice, soybeans are at record high](#), and it is clear that the increase in the atmospheric concentration of CO<sub>2</sub> has enormous beneficial effects through its fertilization properties. Our planet [has seen more than 20% greening over the past three decades, half of which is due to the action of CO<sub>2</sub>](#).

Forecasts of water shortages are also not born out by experience. For example, since the now former Australian Chief Climate Commissioner Professor Tim Flannery warned that dams would no longer fill due to lack of rain, [Australia has been subject to a series of dramatic floods, and overflowing dams](#). Governments’ naïve belief in Professor Flannery’s warnings appear to have led to policy actions and omissions that exacerbated flooding and failed to take full advantage of the rainfall.

To date, there have been no bona fide climate refugees, and neither has mass migration due to global warming been observed. The one person who has asked to be recognized as [a climate refugee](#) has seen his demand being rejected by the Supreme Court of New Zealand. He has returned to his island home, and remains safe from inundation.

7. “... *the carbon dioxide our cars and power plants emit today will linger in the atmosphere for a thousand years.*” Reif (2017).

The average residence time of a CO<sub>2</sub> molecule in the Earth’s atmosphere is in the order of 4-7 years. Taking into account multiple exchanges leads to an estimate of a mean lifespan of 40 years ([Harde 2017](#) and follow up exchanges and debates). Rather than a problem, carbon dioxide in the atmosphere is the prime nutrient for plants. Indeed plants grow more strongly when CO<sub>2</sub> concentrations are much higher than they currently are, as in commercial greenhouses. The current CO<sub>2</sub> concentration is low compared to the levels that have been experienced for much of the history of our planet.

Neither is CO<sub>2</sub> a pollutant. It is a colorless odorless gas that is not toxic to humans and other animals even at concentrations much higher than we are currently experiencing. It is also one of the most important fuels for phytoplankton, which use carbon dioxide for energy and that release oxygen. Up to 75% of the oxygen present in the air finds its origin in the phytoplankton photosynthetic water splitting process.

Moreover, during the Paleozoic and the Mesozoic eras there were long periods during which the levels of CO<sub>2</sub> were much higher than today but the temperatures were far colder. We are not aware of any explanation that squares the manmade global warming theory with that fact.

**8. *“In 2016 alone, solar industry employment grew by 25 percent, while wind jobs grew 32 percent.”***

Solar power accounts for 0.9% and wind generation for 5.6% of the total U.S. electricity production. Electricity itself is a small portion of the total energy consumption, including transportation, industrial processes and heating. Moreover, [several studies](#) have shown that the creation of one “green” job results in the loss of two jobs elsewhere in the economy. In [Spain the ratio can be quite a bit larger](#).

The so-called alternative energy companies survive through heavy subsidies and supportive regulations. For example, [SunEdison received \\$1.5 billion in subsidies and loan guarantees](#) before filing for bankruptcy.

Europe is suffering from political rejection of fossil fuels: energy prices have soared, millions of poor people are unable to pay their energy bills, and energy-intensive businesses are relocating to where energy is cheaper. There is not an example the U.S. should wish to follow.

By withdrawing from the Paris agreement, President Trump did a wonderful thing for America and the world. He showed that advocacy masquerading as science should not be the basis for political decisions.