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## **29 Bullets Tell All about Climate Challenge**

By Mark Fischetti | November 3, 2014



The results are in. Yesterday the United Nations Intergovernmental Panel on ADVERTISEMENT Climate Change [released its final report](#) crystallizing 13 months of work by more than 800 scientists. The “[synthesis report](#)” gives a no-nonsense assessment of how the climate is changing, what is causing the change, the impacts the changes will have on us and the planet, and the “mitigation” steps we should take to prevent the impacts from getting worse. The recommendations are intended first and foremost for national leaders, who in 2015 will make what may be a last-chance effort to reach a binding global climate treaty.

Although the report’s authors try to give a condensed snapshot of [the most important data](#) and recommendations, the document still clocks in at 116 pages. I will attempt, here, to capture what you need to know most, in 29 bullets. Forgive the staccato.

### Climate changes:

- The atmosphere is getting hotter.
- The oceans are getting much hotter, and much more acidic.

### Causes:

- CO<sub>2</sub> emissions are by far the largest cause of global warming and ocean acidification, and they are rising.
- Methane emissions are the second largest cause of warming, and they are rising.
- Since 1950 human activities have led to virtually all temperature rise.
- Natural forces have caused virtually none of the temperature rise.
- The largest human sources of CO<sub>2</sub> emissions are burning fossil fuels, making cement and burning off gas (“flaring”) from oil and gas production.

### Impacts:

- Sea level is rising, and at an increasing pace.
- Glaciers are melting, ice sheets are thinning, and Arctic sea ice is disappearing.
- Permafrost is thawing.
- In North America, snow pack is decreasing.
- The number of cold days and nights are decreasing.
- The number of hot days and nights are increasing.
- Heat waves will occur more often and last longer.
- Heavy rainstorms and snowstorms will become more intense and frequent.
- Overall, precipitation will rise in high latitudes and the equatorial Pacific. In mid-latitudes, dry areas will get drier, wet areas will get wetter.
- Species are vanishing at an alarming and ever-increasing rate.

- Most plants, small mammals and ocean organisms cannot adapt fast enough to keep up with changes.
- Global temperature rise greater than 2 degrees Celsius will compromise food supplies globally.
- Human health problems will get worse.
- Risks to poorer people are greater than for others, in all countries.

What to do:

- To avoid severe damage to natural and human systems, the world should keep global warming to less than 2 degrees C above pre-industrial levels.
- Without more mitigation than is being done today, the temperature is more likely than not to rise by 4 degrees C by 2100.
- Significant reductions in greenhouse gas emissions by 2050 can significantly reduce warming by 2100.
- Keeping greenhouse gases in the atmosphere below the equivalent of 450 parts per million of CO<sub>2</sub> can keep warming below 2 degrees C.
- Levels are likely to stay below 450 ppm if human emissions are reduced 40 to 70 percent by 2050 compared with 2010 levels.
- Allowing levels to reach 530 ppm by 2100 gives the planet slightly better than 50-50 odds of staying below 2C; that would require reducing emissions 25 to 55 percent by 2050 versus 2010.
- To hit a target of 430 to 530 ppm by 2100, the world must invest several hundred billion dollars a year in low-carbon electricity sources and energy efficiency.
- It is highly unlikely the world will stay below 450 ppm without widespread use of carbon capture and storage technologies.

So...improve technical solutions, reach government agreements, and fund them, now.

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