

## From Bill McKibben's July 2012 Rolling Stone article

### "Global Warming's Terrifying New Math"

*An easy and powerful bit of arithmetical analysis first published by financial analysts in the U.K.*

**The first number: 2 degrees Celsius:** From 2009 Copenhagen conference on climate change: The accord did contain one important number; In Paragraph 1, it formally recognized "the scientific view that the increase in global temperature should be below two degrees Celsius." (that's 3.6 degrees Fahrenheit)..This is the same position taken by the G8 (Major Economies Forum) meeting earlier in 2009....167 countries responsible for more than 87 percent of the world's carbon emissions have signed on to the Copenhagen Accord, endorsing the two-degree target.

Context: So far we have raised the global average temperature 0.8 degrees Celsius and that has caused more damage than most scientists expected. (e.g., a third of summer sea ice in the Arctic is gone, the oceans are 30 percent more acidic, and since warm air holds more water vapor than cold, the atmosphere over the oceans is a shocking five percent wetter, loading the dice for devastating floods.)

Maybe 2 degrees C is too much. (NASA scientist James Hansen, the planet's most prominent climatologist, is even blunter: "The target that has been talked about in international negotiations for two degrees of warming is actually a prescription for long-term disaster.")

**The second number: 565 gigatons.** Scientists estimate that humans can pour roughly 565 more gigatons of carbon dioxide into the atmosphere by midcentury (2050) and still have some reasonable hope of staying below two degrees. However, even if we stopped increasing CO<sub>2</sub> now, the temperature would likely still rise another 0.8 degrees, as previously released carbon continues to overheat the atmosphere.

**The third number: 2,795 gigatons** The number describes the amount of carbon already contained in the proven coal and oil and gas reserves of the fossil-fuel companies, and the countries (think Venezuela or Kuwait) that act like fossil-fuel companies.

In short, it's the fossil fuel we're currently planning to burn. And the key point is that this new number – 2,795 – is five times higher than 565.

Yes, this coal, gas and oil is technically still in the soil. But it's already economically above ground – it's figured into share prices, companies are borrowing money against it, nations are basing their budgets on the presumed returns from their patrimony.

We might well burn all that carbon, in which case investors will do fine. But if we do, the planet will crater. You can have a healthy fossil-fuel balance sheet, **or** a relatively healthy planet – but now that we know the numbers, it looks like you can't have both. To stay below the second number, over 80% of the fossil fuel reserves will have to stay in the ground.

Actions? If we had 100 years all our lifestyle changes might add up to a remedy.

Working through government would be more efficient. True we now have greater fuel efficiency required in cars, but the Obama administration has also opened up a huge swath of the Powder River Basin in Wyoming for coal extraction. The total basin contains some 67.5 gigatons worth of carbon (or more than 10 percent of the available atmospheric space). He's doing the same thing with Arctic and offshore drilling.

Given this hard math, we need to view the fossil-fuel industry in a new light. It has become a rogue industry, reckless like no other force on Earth. It is Public Enemy Number One to the survival of our planetary civilization.

Exxon, BP, Russian firm Gazprom, ConocoPhillips, Shell together would use up 25% of our remaining

two-degree budget if their reserves are sold and burned. The largest coal companies include Severstal, the Russian mining giant, followed by firms like BHP Billiton and Peabody.

Alone among businesses, the fossil-fuel industry is allowed to dump its main waste, carbon dioxide, for free. Until a quarter-century ago, almost no one knew that CO<sub>2</sub> was dangerous. But now that we understand that carbon is heating the planet and acidifying the oceans, its price becomes the central issue.

If you put a price on carbon, through a direct tax or other methods, it would enlist markets in the fight against global warming. The higher the price on carbon, the more of those fossil fuel reserves would be worthless.

It's not clear, of course, that the power of the fossil-fuel industry can be broken. The U.K. analysts who wrote the Carbon Tracker report and drew attention to these numbers had a relatively modest goal – they simply wanted to remind investors that climate change poses a very real risk to the stock prices of energy companies. That logic also applies to educational institutions, pension funds, any institutions concerned with our global future.

Once, in recent corporate history, anger forced an industry to make basic changes. That was the campaign in the 1980s demanding divestment from companies doing business in South Africa.

Read more: <http://www.rollingstone.com/politics/news/global-warmings-terrifying-new-math-20120719#ixzz247FwIzjk>

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#### GLOBAL WARMING'S TERRIFYING NEW MATH

**An easy and powerful bit of arithmetical analysis first published by financial analysts in the U.K. and brought to readers of Rolling Stone by Bill McKibben.**

- **The first number: 2 degrees Celsius...** This is the limit to allowable global warming, so said 167 of the world's nations, who account for 87 percent of the global carbon emissions, in the 2009 Copenhagen Accord.
- **Average global temperature: increased 0.8 degrees Celsius** already and will increase to 1.6 degrees Celsius with no new emissions because of CO<sub>2</sub> already in the atmosphere.
- **The second number: 565 gigatons.** Scientists estimate that humans can pour roughly 565 more gigatons of carbon dioxide into the atmosphere by midcentury (2050) and still have some reasonable hope of staying below two degrees.
- **The third number: 2,795 gigatons** This is the amount of carbon already contained in the proven coal and oil and gas reserves of the fossil-fuel companies, (and the countries -think Venezuela or Kuwait- that act like fossil-fuel companies.)
- **These known reserves are figured into corporate share prices, net worth, etc.** even though the fuels are still in the ground. But corporate health demands the fuel be sold and burned.
- **Health of the planet demands the second number:** You can have a healthy fossil-fuel balance sheet, or a relatively healthy planet – but now that we know the numbers, it looks like you can't have both.
- **Are you invested in the planet or in fossil fuel?** Changing your light bulbs is good, but not nearly enough. Governments are not taking effective action on our behalf.
- **We need to call for divestment in fossil fuel companies** patterned after the 1980's divestment from companies doing business with South Africa. We and the companies are riding a carbon bubble in which the cost of the waste product is externalized to us all. Check your portfolio, check your pension fund, check your favorite institution. Together we can make a difference.

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