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Ticking Time Bomb

Geologist John Atcheson has a problem: billions of tons of methane-gas trapped in ice in the Arctic Circle, and the ice has started to melt. This prescient article discusses the possibility of a runaway greenhouse effect with extinction-level consequences within the next century. The really bad news? Atcheson's not writing fiction -- he cites evidence suggesting that it's already happened twice in the past...

by John Atcheson

The Arctic Council's recent report on the effects of global warming in the far north paints a grim picture: global floods, extinction of polar bears and other marine mammals, collapsed fisheries. But it ignored a ticking time bomb buried in the Arctic tundra.

There are enormous quantities of naturally occurring greenhouse gasses trapped in ice-like structures in the cold northern muds and at the bottom of the seas. These ices, called clathrates, contain 3,000 times as much methane as is in the atmosphere. Methane is more than 20 times as strong a greenhouse gas as carbon dioxide.

Now here's the scary part. A temperature increase of merely a few degrees would cause these gases to volatilize and "burp" into the atmosphere, which would further raise temperatures, which would release yet more methane, heating the Earth and seas further, and so on. There's 400 gigatons of methane locked in the frozen arctic tundra - enough to start this chain reaction - and the kind of warming the Arctic Council predicts is sufficient to melt the clathrates and release these greenhouse gases into the atmosphere.

Once triggered, this cycle could result in runaway global warming the likes of which even the most pessimistic doomsayers aren't talking about.

An apocalyptic fantasy concocted by hysterical environmentalists? Unfortunately, no. Strong geologic evidence suggests something similar has happened at least twice before.

The most recent of these catastrophes occurred about 55 million years ago in what geologists call the Paleocene-Eocene Thermal Maximum (PETM), when methane burps caused rapid warming and massive die-offs, disrupting the climate for more than 100,000 years.

The granddaddy of these catastrophes occurred 251 million years ago, at the end of the Permian period, when a series of methane burps came close to wiping out all life on Earth.

More than 94 percent of the marine species present in the fossil record disappeared suddenly as oxygen levels plummeted and life teetered on the verge of extinction. Over the ensuing 500,000 years, a few species struggled to gain a foothold in the hostile environment. It took 20 million to 30 million years for even rudimentary coral reefs to re-establish themselves and for forests to regrow. In some areas, it took more than 100 million years for ecosystems to reach their former healthy diversity.

Geologist Michael J. Benton lays out the scientific evidence for this epochal tragedy in a recent book, *When Life Nearly Died: The Greatest Mass Extinction of All Time*. As with the PETM, greenhouse gases, mostly carbon dioxide from increased volcanic activity, warmed the earth and seas enough to release massive amounts of methane from these sensitive clathrates, setting off a runaway greenhouse effect.

The cause of all this havoc?

In both cases, a temperature increase of about 10.8 degrees Fahrenheit, about the upper range for the average global increase today's models predict can be expected from burning fossil fuels by 2100. But these models could be the tail wagging the dog since they don't add in the effect of burps from warming gas hydrates. Worse, as the Arctic Council found, the highest temperature increases from human greenhouse gas emissions will occur in the arctic regions - an area rich in these unstable clathrates.

If we trigger this runaway release of methane, there's no turning back. No do-overs. Once it starts, it's likely to play out all the way.

Humans appear to be capable of emitting carbon dioxide in quantities comparable to the volcanic activity that started these chain reactions. According to the U.S. Geological Survey, burning fossil fuels releases more than 150 times the amount of carbon dioxide emitted by volcanoes - the equivalent of nearly 17,000 additional volcanoes the size of Hawaii's Kilauea.

And that is the time bomb the Arctic Council ignored.

How likely is it that humans will cause methane burps by burning fossil fuels? No one knows. But it is somewhere between possible and likely at this point, and it becomes more likely with each passing year that we fail to act.

So forget rising sea levels, melting ice caps, more intense storms, more floods, destruction of habitats and the extinction of polar bears. Forget warnings that global warming might turn some of the world's major agricultural areas into deserts and increase the range of tropical diseases, even though this is the stuff we're pretty sure will happen.

Instead, let's just get with the Bush administration's policy of pre-emption. We can't afford to have the first sign of a failed energy policy be the mass extinction of life on Earth. We have to act now.
