Gene Fry, J Earth Sci Clim Change 2016, 7:9(Suppl)
http://dx.doi.org/10.4172/2157-7617.C1.026

Gene Fry
Energy Efficiency & Global Warming Consultant, USA

4.5 to 7.8°C global surface warming from today's CO_2 and CH_4 levels

Earth's surface will warm, due just to today's 400 ppm CO2 and 1840 ppb CH4, by 2-8 x as much as it has since 1880. Already, land surfaces have warmed 1.0 °C (5-year mean) over the last 50 years and 1.5 °C over the last 130. Sea surfaces have warmed 1.0 °C over the past 100. Meanwhile, ocean depths add more heat every 2 years than all the energy humans have ever used. Vostok ice core data analysis connects today's CO2 levels with 7.4 °C surface warming there, compared to the 1951-1980 mean. Using a 50% polar to global Δ°C conversion, using NASA observations since 1880, the Δ 3.7 °C result is highly consistent with CO2 and Δ°C data from 4 and 14 million years ago. Adding Vostok CH4 data to the analysis connects today's CH4 and CO2 levels with 6.5 °C global surface warming above baseline. Δ 3.7 °C globally (more inland and poleward) is enough to make Kansas, "breadbasket of the world", as hot as Las Vegas. The analysis suggests major lag effects to come, mostly from albedo changes. Some major albedo changes come this century, from disappearing Arctic sea ice and anthropogenic sulfates, plus receding snow cover. Albedo effects from ice loss in Greenland and Antarctica happen more slowly. When Earth last had 400 ppm CO2, sea levels were estimated at 20-35 meters above today's, indicating up to 50% ice loss eventually. The loss rate is only 1/4 that during the recent ice ages, but still 6-7 meters/°C.

Biography

Gene Fry completed his PhD in Resource Economics from Cornell University in 1989. He was Director of Policy and Planning for the Maine Energy Office, then Economist in the Electric Power Division of the Massachusetts Utility Commission for 13 years. After stints as contributing Editor for climate change issues at the Global Environmental Change Report and Business and the Environment, he managed energy efficiency program evaluations for Northeast Utilities for 3 years, until he retired in 2011. He has published 2 articles in refereed journals.

gene.fry@rcn.com