

Report is a landmark for humanity (published Rutland Herald, March 11, 2007)

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In early February 2007 the Intergovernmental Panel on Climate Change released its report, Physical Basis for Climate Change. It is the first volume of "Climate Change 2007," and it has taken the 600 drafting scientists from 40 countries (with an additional 620 expert reviewers) five years to analyze all the new research and reach unanimous agreement. The report also received the unanimous endorsement from all the representatives of the 113 governments (including the United States) who attended the final meeting in Paris.

The report says there is unequivocal evidence that the climate system is warming, as a result of rising greenhouse gas levels from the burning of fossil fuels (as well as land-use changes and agriculture).

All the evidence now fits: The air and oceans have warmed, snow and ice are melting in many regions, and sea-level is rising. The climate is warming faster over land and in the Arctic; and heat waves, heavy precipitation and droughts have become more frequent.

The past 50 years have been warmer than any time in the past millennium. The projections of our models (which have improved substantially since the last report in 2001) are consistent with what we see happening. We are already committed to further warming in the next twenty years, about 0.7 degrees Fahrenheit for the globe, roughly double this over land, and more at the poles. For Vermont, this means a mean warming close to 2 degrees Fahrenheit by 2030.

Humanity may not have made a conscious choice, but the earth is committed, because we took no action in the past 20 years to reduce our burning of fossil fuels. Much of the added carbon dioxide will not be removed from the atmosphere for a century or more. The earth must warm further, in order to radiate more heat energy into space (through its stronger 'greenhouse' atmosphere), as it seeks energy balance.

The earth is committed to warming for the next 20 years, but at least now our choices are clear. Whatever action we take (or fail to take) in the next two decades will critically impact temperatures and climate later in this century. Our best estimate for the mean warming of the earth from a doubling of atmospheric carbon dioxide is about 5 degrees Fahrenheit (and again, more over land and in the north).

How can we prevent a doubling of atmospheric carbon dioxide? Only by making a major effort to make our energy economy more efficient and shift it from fossil fuels to renewable energy sources.

The IPCC Report notes one critical further warning. If we go back 125,000 years, to a time when the polar temperatures were much warmer than today (because of differences in the earth's inclination and orbit around the sun), global sea-level was about 16 feet higher than it is now. We will reach similar temperatures at the North Pole later this century, if our burning of fossil fuels continues to grow. We do not yet know how long it will take for the polar ice to melt – possibly centuries – but satellite images are already showing an acceleration of the melt of sea-ice and the Greenland ice-cap. Even after greenhouse gas levels stop rising (which won't happen until we drastically reduce the burning of fossil fuels), warming and sea-level rise will continue for centuries, until the earth reaches a new equilibrium.

For more than a decade, money (much of it from the fossil fuel industry) has been poured into generating misinformation on the science of climate change, in an effort to confuse the public and postpone the day when the United States takes action. This public deceit has been backed by the present administration in Washington for the past five years. There has however been a visible collapse of this resistance in the last few months, because this new IPCC report, with its clear scientific evidence, was made available on the Web in draft form last fall.

Finally this Valentine's Day, the last hold-out in the oil industry, ExxonMobil, threw in the towel with full-page ads in the Wall Street Journal, admitting that climate change was real.

Now the dissenters have switched from protesting the science to protesting the economic cost of change. I am a scientist, not an economist, but I know economic projections are far more uncertain than forecasting the earth's climate!

Even so, it is clear that the cost of doing nothing will be far higher than the cost of using our technology to intelligently fix a problem that was generated by our technology in the first place. As a citizen I also ask whether our democracy, not to mention the fate of the earth and the lives of its children, should be determined by those motivated by short-term economic interests, simply because they have the money to buy influence.

There is a critical mismatch between the time scale of the earth, which requires us to look decades and centuries ahead, and the traditional time scales of business and politics. No wonder the native peoples of this land, who intuitively understood the earth's ecosystems rather better than we, thought in terms of the impact over seven generations, about 150 years. I am beginning to appreciate the significance of such time scales much more clearly. I remember my grandfather, and how different life was for him before airplanes and cars; and I can see the future fast approaching for my granddaughter. Let us discuss in our communities what we would like to see for our grandchildren's future, and earnestly start the search for solutions.