

# REVISITING CLIMATE CHANGE

Neither Barak Obama nor Mitt Romney, the two presidential candidates in the 2012 US election race, are discussing the challenge of climate change in their platforms. In the meantime, the oil, coal and gas industries are mounting aggressive efforts to defeat Obama who presents the greatest threat of the two candidates. These companies want policies that are friendlier to fossil fuel use which means relaxing air pollution rules and encouraging oil and gas drilling. At the same time clean air rules and restrictions are vigorously criticized.

It is time to revisit the climate change issue, with a dialogue between a skeptic and a believer.

**SKEPTIC:** We are asked to make major changes in our economy based on the slim evidence for increased warming over the last century. This warming may not be significant. The changes proposed are based on the *theory* that more fossil fuel input in the atmosphere by humans will in time create major climactic damage. Dramatic changes in climate in the past hundred years are not proof in themselves that humans are involved. The earth's atmosphere has gone through countless temperature swings in its 4.5 billion years. How can we be sure that the current warming, if significant, is not the result of natural variation and not the result of human use of fossil fuels? The science is neither settled nor convincing. There could be other causes; e.g. increased energy from the sun. Why should we gamble our economy on the uncertainties in predictions of a dire future?

**BELIEVER:** Lets start with some non-controversial facts based on direct observation and not on theory. Current global temperatures are warmer than they have ever been over the past five centuries. This data is based on instrumental measurements going back 150 years. Further back in time information is derived from numbers of tree rings and ice core measurements. Data such as these go back more than a thousand years.

CO<sub>2</sub> emissions have increased dramatically over the last century. CO<sub>2</sub> levels are determined by measurement made in airplanes and satellite observations as well as from polar ice cores. Using these methodologies, the concentration of carbon dioxide (CO<sub>2</sub>) is now known for the past 650,000 years.

The theory of climate change is based on the following : sunlight passes through the atmosphere and warms the earth's surface, This heat is radiated back towards space. Most of the outgoing heat is absorbed by greenhouse gases and radiated back to earth.. As CO<sub>2</sub> levels rise so do temperatures at the earth's surface. There is

FROM THE UN

# REVISITING CLIMATE CHANGE

a significant amount of evidence to support the theory of climate change. Like most scientific theories it cannot be definitively proven, but it is the most conclusive evidence currently available.

Your question about the energy from the sun is a good one since the sun's energy is the fundamental source that drives our climate system. Studies show that since 1750 the average amount of energy coming from the sun has basically not changed, we cannot therefore, explain the warming trend on extremes in sun energy.

In 1988 James Hansen a climatologist with NASA's Goddard Institute, warned that the world was getting warmer due to the build up of green house gases. Now that global warming is a serious environmental issue requiring global attention, the United Nations initiated a panel on climate change (IPCC) with over 2000 independent scientists from over 130 countries. They have studied results from *direct* measurements and deep ice cores. The records show that at no point in the last 2000 years have the earth's temperature changed as rapidly as in the 20th century. Detailed reports show that there is a more than a 90 percent chance that human activities in the past 250 years have warmed our planet. It would be risky to ignore this scientific consensus.

**SKEPTIC:** The projections of future dire consequences are based on computer models. Models are only as good as the assumptions in their formulation. Can they be trusted ? How good are they?

**BELIEVER:** Good question ! The models do rely on assumptions but they have become increasingly sophisticated. One way of testing the quality of today's climate models is their ability to simulate the past-especially the twentieth century for which we have good data. For example, if we go back to 1900 and look forward at the actual record of global temperature and compare it to the computer model simulation we see a good fit. We can also compare actual records with a simulation without much CO<sub>2</sub>. The result clearly shows the effect of the human input.

Do we want to gamble on the future?

If we invest in clean and renewable energy and the climate deniers are right we will still come out ahead with energy jobs and healthier lives and , just as importantly, less dependence on Middle East oil. If the mainstream scientific consensus is correct and we do not control the emissions of specific gases the

FROM THE UN

# REVISITING CLIMATE CHANGE

global outcome could be disastrous. The insurance principle indicates that action is called for.

Some companies and countries like China and India are betting on the future and are increasingly investing in renewable energy, more than \$257 billion in 2011. Currently ,only 6 percent of the world's energy is generated by renewable sources but it is growing .

It is vital that we bet on a future that increasingly uses clean energy.

Dr. Sylvain Ehrenfeld, the IHEU and National Ethical Service representative to the UN and Dr. Reba Goodman member of BECS.