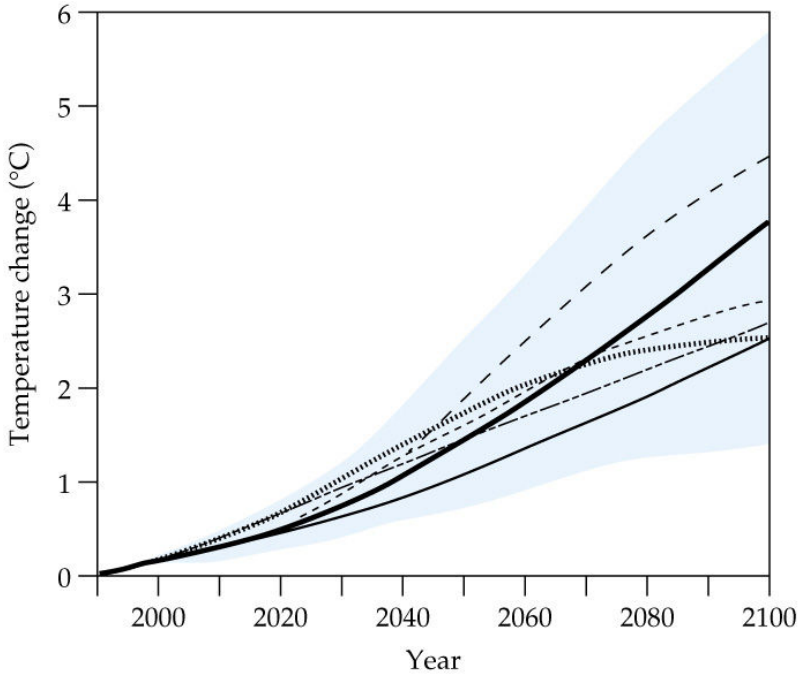
CO_2 causes global warming: http://gristmill.grist.org/story/2006/11/11/23656/027 Humanity is at a critical crossroad. We can continue a reliance on fossil fuels and the CO_2 buildup will continue. Or we can switch to non-fossil fuel energy sources and stop the buildup. Climate models show that a CO_2 buildup is heating up the Earth. The text http://tinyurl.com/ygerqx - Ecology of a Changing Planet, Mark Bush, Ch 17 shows climate model predictions:

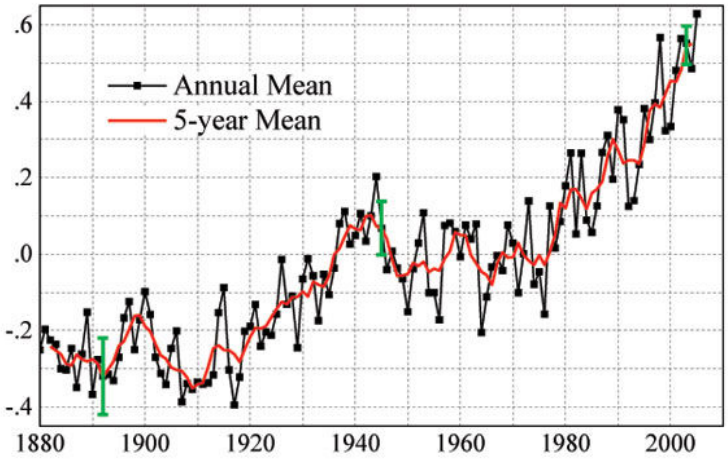
Predicted Temperature Rise From 1990



- Five principal research groups.
- Differences in the predictions are due mostly to social and political assumptions.
- The medium estimate is an average Earth temperature rise of ~3.5 °C from 1990-2100.

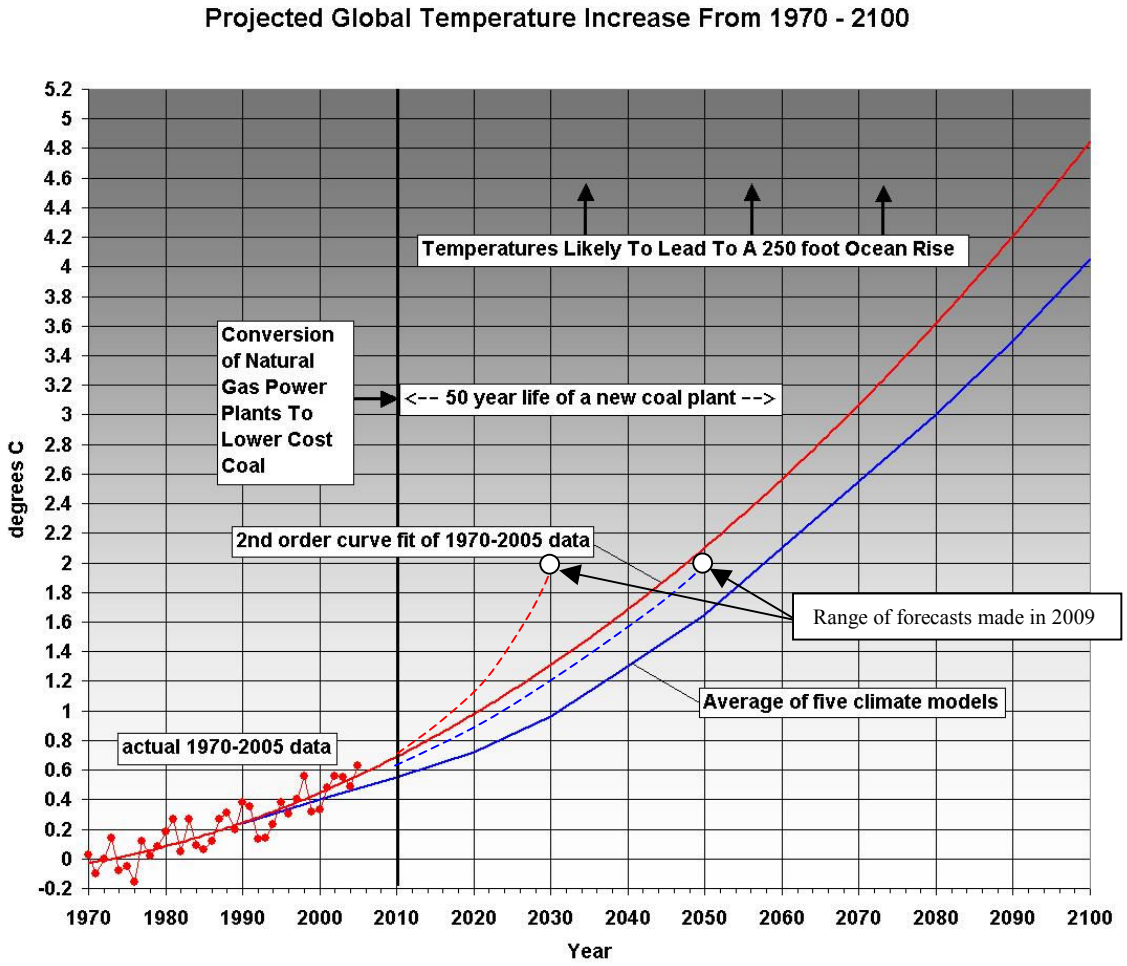
Now lets move from the forecast climate models to what is actually happening. The site http://www.nasa.gov/centers/goddard/news/topstory/2006/world_warmth.html is the source of the graph below showing actual measured world-wide temperature from hundreds of recorders. Of particular interest is the last 35 years of data from 1970 through 2005. There appears to be a slight second order rise.

Global Land-Ocean Temperature Anomaly (°C)



see the 2006 update: http://earthobservatory.nasa.gov/Newsroom/NewImages/images.php3?img_id=17553

Overlaying the two graphs allows a comparison of the actual versus the predicted temperatures as shown in the graph below. The red projected line is an Excel spread-sheet second order curve fit on the actual 1970-2005 temperatures. Most climatologists believe that as the world heats up, the Greenland and Antarctica ice will eventually all melt. The gray area expresses the scientific uncertainty in predicting how high a temperature rise is needed to melt all the ice. The Greenland and Antarctica ice recent accelerated melting indicates they are already responding to increased temperatures.



What I am trying to show in this graph is that a coal plant built today will make a major contribution to heating the Earth to the point of melting continental ice, warming the oceans, and causing a ~250 feet ocean rise. How much coal burning is predicted? A forecast is posted at: http://www.eia.doe.gov/oiaf/ieo/coal.html. Keep in mind that the CO_2 is cumulative; therefore the area under the forecasted coal usage is the driver of the temperature rise. I expect to see temperature rises even more dramatic than the red line in the above graph since we are now switching from natural gas to coal.

To stop the CO_2 buildup we must devise ways to eliminate the major sources of CO_2 atmospheric emission (power plants and vehicles) as soon as possible. An appropriate start in this process is to impose a CO_2 tax on the producers so that competing technologies will emerge. The extra tax revenue should be used to subsidize green energy sources such as wind, solar, nuclear power; and research on: CO_2 removal, solar power, nuclear fusion, and nuclear waste transformation.

What are the consequences of inaction? Reflect for a moment on how a 250 foot rise in the oceans will affect the world and our descendents. That's a story of human misery of biblical proportions. It is a story that will take volumes to tell and is well beyond my ability to adequately describe it here. However, please consider the following:

A 250 foot rise in the oceans will impact every human being on this Earth. All coastal cities will be wiped out, disrupting shipping and commerce. You will be deprived of your favorite Japanese or Chinese product, or some food product from halfway around the world, nor will you be able to buy one of those low polluting Japanese cars because the port terminals will not exist.

Billions of people will move inland and want a place to reside, as their homes are flooded. They will be without jobs, without food, without housing. They will not be happy campers. Nor will those that aren't flooded be able to help them because our transportation infrastructure will be a complete mess. You may think that new ports can be built, but with a rising ocean each year, how will you know where to build them?

I'm looking at the South Texas Nuclear Project and thinking, good grief, that's one fine zero CO_2 emission power source and its going to be completely under water one of these days! The same is true for all power plants along the Texas coast, which must be half the total generating capacity of the state. Millions will have to evacuate the Texas Coastal plains and head inland as the waters relentlessly rise each year. However, there will be insufficient resources such as water, electric power, food, housing, transportation, jobs, etc. to support such a massive migration.

Why would we want to risk taking such a path as is described above? It seems a lot less painful to plan on moving off fossil fuels now rather than wait and suffer these consequences. Let's consider the two opposite outcomes. 1) Suppose we were to develop alternatives to CO_2 producing energy sources and then we found out that the planet was not going to heat up after all. The economic consequences of being cautious and moving off CO_2 production now are probably small. We would have to build a whole new infrastructure of power plants that do not emit CO_2. We would have to build a new transportation means, probably electrified, or on batteries, or on manufactured hydrogen, or if we are lucky, on getting the fusion power source to work. 2) Suppose we take no action and build the next 1000 600 megawatt coal power plants in the next ten years, and we continue to sell and drive big SUV type cars for the next several decades. Within 50 years we would have driven up the CO_2 levels to higher than life on Earth has ever seen. We might even turn our planet into another Venus, which is 800 degrees F.

It seems to me that the logical action plan is to prepare for the worst scenario and hope for the best scenario. The economic devastation that will be caused by not taking action now and seeing the oceans rise uncontrollably is absolutely unacceptable. I can see this so clearly. This is such a new topic people are having a hard time believing this will actually happen. Or maybe it is because the forecast is so painful, people just put it out of their minds (head in the sand approach).

I hope this paper causes you to lose some sleep and more importantly, jolts you into becoming proactive in the movement for eliminating CO_2 production worldwide.