September 16, 2008

Governor David A. Paterson
State Capitol
Albany, NY 12224

Dear Governor Paterson,

I would like to take this opportunity to communicate with you on a matter that will have a great effect upon the State of New York, our country and the world. I refer to climate change, specifically global warming in response to human-made carbon dioxide (CO_2) and other pollutants. This topic has long remained in the background, but it is now poised to become a dominant national and international issue in years ahead. Years of inaction have put us in a difficult situation. In my opinion, we have less than ten years to reverse the current trend of ever increasing levels of greenhouse gas emissions or we will be unable to avoid the worst consequences of global climate change and will leave our grandchildren and future generations a planet with conditions spiraling out of control.

Global warming presents challenges to political leaders, but also great opportunities, especially for New York State which has traditionally been a national leader in setting energy policy. New York is now in position to continue that leadership, as the state is moving ahead with a renewable portfolio standard to increase reliance on renewable energy technologies, an energy efficiency portfolio standard to reduce energy use by 15% (compared to projected energy use) by 2015, and a commitment to a Regional Greenhouse Gas Initiative that will gradually reduce carbon dioxide emissions from power plants in ten participating Northeast and Mid-Atlantic states. However, given what we know now about climate change and how rapidly it is progressing, leadership in addressing this problem will require an acceleration and expansion of these efforts and the rapid implementation of other sustainable energy policies. The challenge we face is unlike any we have seen in history.

Before addressing needed policy initiatives, I want to make you aware of rapid progress in the understanding of global warming. Warming so far, averaging 2 degrees Fahrenheit over land areas, is smaller than weather fluctuations. Yet it already has noticeable effects and more is "in the pipeline," even without further increases of CO_2, because of climate system inertia that delays the full climate response. As you know, the most recent assessment of the Intergovernmental Panel on Climate Change declared that there is a consensus in the scientific community that climate change is caused by human activity – primarily the burning of fossil fuels.

These are the likely global consequences of climate change:

- Higher average temperatures, more frequent heat waves
- Greater warming at high northern latitudes
- Loss of Arctic summer ice cover and melting of permafrost, possibly releasing methane and accelerating warming
- Melting of ice sheets, ice shelves, and glaciers, raising sea levels and inundating coastal areas worldwide
- Intensification of the hydrologic cycle, that is, stronger heat waves, droughts and fires, but also heavier downpours and flooding
- Decreased fresh water supplies, especially in subtropical regions and large areas dependent on runoff from mountain glaciers
- More powerful storms driven by latent heat, including hurricanes and thunderstorms, and thus increased storm damage
- Migration of tropical diseases and pests toward the poles
- Shifting of ecological niches poleward, threatening massive species extinction
- Disruption of agriculture and increased risk of famine
- Exacerbation of eco-refugee problem as millions abandons their homes in search of survival
- Increasing political strife and risk of war

Already we are seeing many of these impacts, some in New York. We can anticipate the impact of higher sea levels and the eventual flooding of parts of Manhattan and other NY coastal areas and potentially lower water levels in the Great Lakes in the coming years.

Governor Paterson, the scientific advances in just the past few years, paradoxically, carry both bad news and good news, the latter assuming that we take appropriate actions. The enclosed paper, "Target Atmospheric CO_2: Where Should Humanity Aim" (http://arxiv.org/abs/0804.1126 and Supporting Material: http://arxiv.org/abs/0804.1135), makes clear that we have already passed the threshold of atmospheric CO_2 levels that we can allow to exist over the long-term. Previously, we thought climate change could be effectively contained if we could hold atmospheric concentrations of CO_2 to below 450 parts per million (ppm). But now research is showing that the threshold of relative climate safety is no higher than 350 ppm – an alarming number given that CO_2 levels are already at 385 ppm. Mother Nature, as a friend of mine has noted, is wagging her finger at us, saying "Now you have gone too far!"

The consequences of ignoring this admonishment would be dire. The Earth is nearing climate "tipping points" with potentially irreversible effects, including extermination of countless species, ice sheet disintegration and sea-level rise, and mass dislocation of populations.

The good news is that it is still feasible to solve the problem, to reduce CO_2 emissions over coming decades and draw down the atmospheric CO_2 amount through natural processes and with the help of improved agricultural and forestry practices. By drawing down the CO_2 amount we can not only avert catastrophic irreversible effects mentioned above, but also alleviate problems that were beginning to seem intractable and inevitable. I refer here to regional effects such as the desertification of the American West (and similar effects in the Mediterranean region, Australia, and parts of Africa and South America), acidification of the ocean with destruction of coral reefs, and recession of alpine glaciers worldwide with accompanying loss of a principal freshwater source for hundreds of millions of people during the dry season.

However, the solution of the problem has one unavoidable implication for fossil fuels. As the attached "Fossil Fuel Facts" make clear, atmospheric CO_2 can be successfully constrained only if coal use is phased out except where the CO_2 is captured and sequestered so that it does not enter the atmosphere. However, carbon capture and storage (CCS) technology, while likely feasible, is not yet commercially demonstrated. Given the ten to fifteen year horizon before this technology could see widespread deployment, its unknown though probably unfavorable economics, and the absence of demonstrated retrofit capability, new coal-fired power plants should not be built now under the presumption of eventual CCS. The "carbon capture ready" subterfuge should be resisted vehemently as should the term "clean coal" which is an oxymoron given all the adverse impacts of coal mining, processing and combustion.

One of the "Fossil Fuel Facts" is that a substantial fraction of fossil fuel CO_2 emissions stays in the air for what is, for all practical purposes "an eternity," more than 1000 years. That is a well established scientific fact – there is no debate. A direct implication is that we cannot be aiming for a 50, 80 or 90 percent reduction of emissions. We must transition over the next several decades to practically zero net CO_2 emissions. Thus our energy focus must be to phase out reliance on fossil fuels while aggressively developing renewable energies and energy efficiency.

I am aware of the statewide effort to oppose a new proposed coal-fired power plant for Jamestown, New York. While this is a small plant, it has become a flash point for state energy policy because of concerns about climate change. I commend the organizations which have opposed this plant because it is through their efforts that the Jamestown Board of Public Utilities proposal has evolved from a conventional coal burner to a project which is now intended to demonstrate and utilize CCS. This is a big improvement though I understand the merits of this project are still being questioned because the power plant itself is not needed to meet Jamestown electric requirements above what is provided by the New York Power Authority. I also commend you and your energy and environmental policy team for listening to the criticism offered by these environmental organizations and insisting that CCS be a permanent operating permit condition for this power plant, if it is built.

In support of the coalition of environmental groups which is meeting with your energy and environmental staff today, I wish to encourage your administration to demonstrate national leadership by enacting policies which would:

1. **Ban the construction of new coal-fired power plants without full CCS.** Given that CCS technology is not commercially available at this time, this policy means in effect a moratorium on all new coal plants irrespective of whether they are labeled "carbon capture ready." This policy should be broadly conceived to also prevent the construction of new carbon-intensive energy facilities like the petroleum coke gasification plant now planned for Lackawanna, NY, which would vent vast quantities of carbon dioxide emissions into the atmosphere.

2. **Phase out existing coal fired power plants over the next ten years.** These plants now provide 12% of New York's power generation. The elimination of this capacity can be made up through a combination conservation and efficiency and renewable energy resources.

3. **Require a greater than 90% long-term permanent CCS rate for the Jamestown plant or any other project demonstrating CCS.** This CCS performance standard is consistent with what is required to phase out fossil fuel emissions and especially to keep the carbon in coal reserves out of the atmosphere. Your administration's proposed CCS rate (equal to that of a "state-of-the-art combined cycle natural gas plant") is not adequate. Nor should we rely on unknown future carbon markets, subsidies, and federal regulations to bring CCS rates closer to what proponents of oxy-fire technology promise is technologically possible, e.g. 95%+ CCS. This high performance standard should be required.

Governor Paterson, it is essential that you use the bully pulpit of your office to rally support from New Yorkers and the State Legislature for much more serious and bold action on energy policy and climate change. You can and should also seek to influence the national debate and response to this problem, which thus far has been woefully and dangerously inadequate.

Among other things, what we need on the national level is the enactment of a policy that would gradually and continually increase the price of carbon emissions. This could be through a cap and trade arrangement or, better, as a carbon tax. Putting an increasingly hefty price on carbon will ensure that, as oil production inevitably declines, humanity does not behave as a desperate addict, seeking every last drop of oil in the most extreme pristine environments and squeezing oil from tar shale, coal, and other high-carbon sources that would ensure destruction of our climate and most species on the planet. Recognition by industry of a continually rising carbon price (and elimination of fossil fuel subsidies) would drive innovations in energy efficiency, renewable energies, and other energy sources that do not produce greenhouse gases. A carbon tax should be revenue neutral and contain a mechanism for providing relief for low income families

disproportionately impacted. In my opinion, 100 percent of the money collected through a carbon tax should be returned uniformly to the public on a per capita basis via monthly deposits in their bank accounts (or an annual check if they have no bank account). Only with this approach will the public support a tax. This approach allows the person who does better than average in reducing his carbon emissions to make money, and it provides the resources for consumers to invest in more efficient and low-carbon technologies.

Tipping points and positive feedbacks exist among people, as well as in the climate system. Perhaps the most important question is this: can we find the leadership to initiate the tipping point among nations? Can we find a country that will enact and begin honestly implementing policies that will phase out fossil fuel emissions in the time frame required? Unless this happens soon, there is little hope of avoiding the climate tipping points, with all that implies for life on this planet. By enacting the far-reaching policies needed to check climate change, New York can set an example and play a major role in getting the United States to assume the leadership role that is so essential for our descendents and for nature.

Sincerely,

James Hansen, Ph.D.
Adjunct Professor, Columbia Earth Institute

Enclosures:
Target Atmospheric CO_2: Where Should Humanity Aim
Fossil Fuel Facts