

# Global warming: cause and mitigation research paper sample

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As fossil fuel supplies around the world head towards vanishing point, their continued use is - in the opinion of many leading experts - contributing to climate change, resulting in global warming. There are also other factors at work including natural causes; our planet's history shows that cyclic climatic swings are a natural phenomenon. "Solar and orbital variations" (n. d.) notes that global variations in temperature are thought historically to have been the result of fluctuations in solar activity and of the orbital variations of our planet with respect to the sun. However, it is the anthropological factors - those within man's control - that should be our main concern, because we could do something about them. Following are three of the main evidential signs that global warm is real, according to Mulvaney (April 2013):

- Atmospheric CO2 Concentrations Increasing: Studies of polar ice have shown that for circa 650, 000 years CO2 in the atmosphere was between 180 and 300 parts per million. In the 1700's the figure was 280ppm (still within that range). It is now almost 400ppm. The rise is almost entirely due to burning fossil fuels.
- Global Mean Temperature Increases: Overall, the increase over the last 100 years has been 1. 33 deg. F (0. 74 deg. C). More than half that increase was since 1979.
- "Arctic Sea Ice Is in a Death Spiral": Mulvaney reports that Arctic ice is currently decreasing by circa 13 percent per ten years (compared to an averaged 1979-2000 figure). Last year (2012) the extent was some 293, 000 square miles less than in 2007 - the previous lowest ever - an area equivalent to the whole of Texas. The ice is also thinner, and is estimated to have lost circa 80 percent in volume.

So, accepting that global warming is real, and is happening, we need to do what we can to mitigate the effects and/or to slow down or even reverse the process. In June of this year (2013) President Obama announced the approach to be adopted by the U. S. government in this regard (“ President Obama's Plan to Fight Climate Change”, June 25 2013). The plan comprises various strategies aimed at reducing carbon emissions. These include establishing and imposing standards of carbon pollution for power generating plants, which currently are the source of 40 percent of America’s greenhouse gases. In parallel with that initiative, the plan calls for further progress in the field of renewable energy sources, building on the achievements during his first term in office, when the energy from renewable sources was more than doubled. Ambitious targets as set out in the plan include renewable energy sufficient for 6 million homes by 2020 and to dramatically increase renewable energy sources for Department of Defense installations by 2025. Transportation has also been targeted. Both heavy duty goods vehicles and passenger vehicles (e. g. buses) are the subject of increasingly tight fuel economy standards as well as the increasing research into biofuels. Energy efficiency of our homes and businesses is another target of the President’s plan. The plan seeks to help individuals and businesses (including loans facilities) to improve energy efficiency of buildings, saving an estimated 3 billion metric tons of carbon by 2030. Other greenhouse gas emissions (e. g. hydrofluorocarbons [HFCs]) are also targeted, setting new lower emission standards for the future. Overall, the President’s plan aims to generate by 2020 some 20 percent of the country’s electrical energy from renewable sources.

Although these various mitigation strategies are necessary if catastrophic and possibly irreversible global warming is to be avoided, how cost-effective are they? In terms of electricity generation, it is clear that phasing out fossil fuel power plants and replacing them with renewable sources of energy makes sense, especially as the existing plants reach their end of useful life. However, there will be the initial development and manufacturing costs for the renewable sources of energy generation as well as the decommissioning costs of the defunct power plants.

Another and promising strategy is the introduction and/or reintroduction of forests, allowing the trees to perform their natural function of converting CO<sub>2</sub> to oxygen. A third aspect in that regard would be a policy to halt deforestation that is contributing to the CO<sub>2</sub> emissions problem. Creating / re-creating / protecting forests is a relatively low-cost way of reducing greenhouse gas emissions, but would require firm policy decisions at government level in the countries involved (Reyer, Guericke & Ibsch, 2009). According to Hood (Sept 2011), the least-cost strategy can be defined as that strategy “ with the lowest implementation costs per avoided tonne of CO<sub>2</sub> over the duration of the transition” (p. 7). She also adds that the most cost-effective policy is one where the desired environmental objective is achieved at the lowest cost to the economy, yet is accepted by the public. She sees carbon pricing as “ a cornerstone policy” (p. 60), but which needs combining with other policies for a complete solution, dependent on the economy of individual countries.

As far as this writer is concerned, the U. S. would be a main focus of proposed tightening of emissions standards, because as a nation it is one of

the world's worst offenders in terms of greenhouse gas emissions. Although President Obama's plan sounds good, the United States still has a long way to go. Power generation and transportation are particularly "guilty" in this regard and would be the main targets for tightening of emission standards – even tighter than those outlined in the "Obama" plan. As Hood states in the Conclusion to her paper (p. 61): "As global emissions continue to rise, the window for taking action that will allow temperatures to stay within the 2 degrees C target is rapidly closing. The time for action is now". She adds that governments need to implement combined policies to provide the least-cost, effective and realistic response needed. Perhaps reforestation could be one of the policies for the U. S. administration. There are vast areas of the country that would be ideal for that purpose.

## References

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