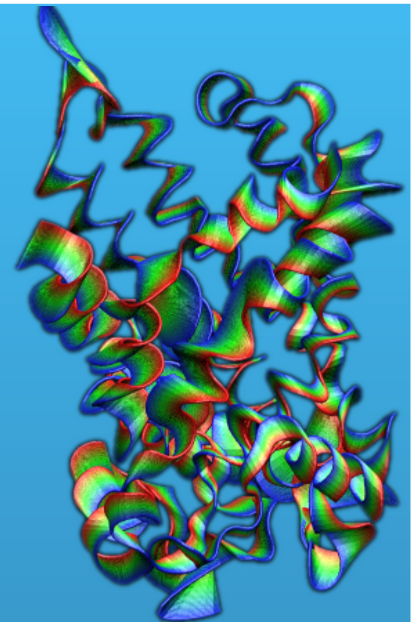

Evaluation and Presentation of Experimental Data – I

Dr. Pramod Abichandani

ENGR 201 – Biweekly Assignment 2

Greenhouse gases and Environmental Policies

Greenhouse gases

Global Warming Potential (GWP) is a measure of how much heat is trapped in a certain mass of gas.

1) Provide a formal definition of the GWP along with GWPs of most greenhouse gases.
2) According to you, is the GWP a good measure to aid in the understanding of global warming and greenhouse gases? Explain your answer.
3) Enlist three other indicators that provide a good understanding of various effects of global warming. Provide formal definitions and reasons for selecting these three indicators.

Environmental Policy

A popular definition:
Environmental policy is any [course of] action deliberately taken [or not taken] to manage human activities with a view to prevent, reduce, or mitigate harmful effects on nature and natural resources, and ensuring that man-made changes to the environment do not have harmful effects on humans [1].

One of the main goals of an environmental policy is to regulate the emission of greenhouse gases in the atmosphere. There are several approaches to achieve this goal. Investigate the following standards and tools to get an idea of how to shape your environmental policies.

1) National Ambient Air Quality Standards
2) Emissions allowances
3) Allowance trading

[1] McCormick, John (2001). *Environmental Policy in the European Union. The European Series*. Palgrave. p. 21.

Industrial Sectors

Transportation Sector

a. Highlight the vehicle fuel economy trends in the U.S. from 1975-2011
b. Highlight the trends in CO_2 emission in the U.S. due to vehicle emissions from 1975-2011
c. Is there a correlation between the fuel economy and CO_2 emissions? Explain your findings.
d. Using historical gas prices in the state of PA, ascertain the maximum and minimum gas prices between 1975-2011.
e. Is there a correlation in PA gas prices and U.S. CO_2 emissions between 1975-2011? Explain your findings.
f. Where should we go from here in terms of the improvements in vehicle fuel economy and CO_2 emissions?

Energy Sectors

a. Find out the average CO_2, So_2 and NOx emissions per year in the U.S. due to electricity generation between 1990 and 2010
(http://www.eia.gov/state/state-energy-profiles-more-environment.cfm)

b. Compare the emission from coal-fired and natural gas-fired electricity generation plants

c. Find out the yearly average prices of coal and natural gas between 1990 and 2010
NG: http://www.eia.gov/dnav/ng/ng_pri_sum_dcu_nus_m.htm
Coal: http://www.eia.gov/totalenergy/data/annual/showtext.cfm?t=ptb0709

d. Find out the emission allowance prices for So_2 and NOx
http://205.254.135.7/todayinenergy/detail.cfm?id=4830
http://www.emissiontrading.com/

e. Is there any correlation between the emission from industry and the emission allowance prices trend?

g. What might have influenced the emissions and emissions allowance?

h. What would you suggest to be added to the regulation that might help decrease in emission from energy sector?

Correlation

a. Create a formula that can capture the correlation between two random variables
b. Provide the correct formula for correlation from a textbook and explain how your formula differs from the textbook formula

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