Good example of physics essay

Environment, Climate Change

Global Warming: Cause and Mitigation

Global Warming: Cause and Mitigation

Global warming is the change in the climate due to the rise in the temperature of the earth’s atmosphere and the oceans. Ocean and climate are linked to each other and so oceans bear the effect of climate change as evidence by increase in the sea level and change in the temperature. This rise in the temperature of the earth’s surface caused increased global warming of the climate. This change in the climate in turn impacts the health of marine species, ecosystem and also humans. Similarly the greenhouse gases produced by the human activities adversely affects the oceans. These impacts include air, water temperature changes, seasonal shifts and rise in sea level. There are two types of the sources that lead to change in the environment which is anthropogenic that is man-made and natural sources. (Mitchell, 2013)

Natural sources of climate change include rainfall, volcanic eruption, air pollution and the temperature of the atmosphere. All these sources cause the global warming of the system. For example when the volcano erupts it throws a large volume of gases commonly sulphur dioxide or the dust into the atmosphere. The sulphur dioxide reacts with the water vapors or moisture and form sulphuric acid that leads to effect climate by acid rain changes the system. Similarly, during devastations a large quantity of gases, ash and smoke from the forest, grass and swamp fires increases the pollution level at a great rate for years that causes the change in the climate and affects the life of human. (Mitchell, 2013)

Ocean current is also natural source as oceans are the main component of

climate system. Ocean current is basically the flow of surface water of ocean in prevailing direction. This directed flow of water is due to the driving forces that includes wind, moisture fluxes and tidals from the gravitation pull of the moon and sun. All these reasons make change of climate in different parts of the world. Similarly, the lower part of the atmosphere called air is formed from gases in the atmosphere namely carbon monoxide, nitrogen, carbon dioxide, oxygen and trace particles of some other gases. The increased amount of these gases in the atmosphere affects our system e. g. the increased oxygen develops the ozone layer which is the shield against the sun ultra violet radiations that changes the climate. Some other natural sources are ozone, mist, fog and radon. (Mitchell, 2013)

Anthropogenic sources are different from the natural sources because these are man-made sources. It includes many factors such as pollution from the oil refineries, industries, hospitals, buildings, motor vehicles, space heating, power plants, and refuse disposal and transportation resources. Carbon dioxide, methane, per fluorocarbons (PFCs), chlorofluorocarbons (CFCs) and hydro flour carbons (HFCs) etc. (Mitchell, 2013)

Chemical compounds present in Earth's atmosphere all behave as 'greenhouse gases'. These gases directly allow sunlight of shortwave energy to reach the Earth's surface unimpeded. Due to shortwave energy it heats the surface and similarly longer-wave (infrared) energy (heat) is re radiated into the atmosphere. Greenhouse gases absorb this energy and then trapping it in the lower atmosphere. Most of the gases occur naturally for example; methane, carbon dioxide, nitrous oxide and water vapor, while others are synthetic or man-made namely Per fluorocarbons (PFCs), hydro

fluorocarbons (HFCs) and chlorofluorocarbons (CFCs) as well as sulphur hexafluoride (SF6). (" Greenhouse gases," 2013)

Reducing the amount of future climate change is called the mitigation of climate change. Knowing that global warming we should reduce it by some technical and scientific ways. There are many types of strategies for the mitigation of global warming for example, carbon sequestration, carbon tax, higher fuel efficiency and clean coal technology. These all may help in reducing the pollution or global warming that is due to the emission of greenhouse gases. Among these methods the best methods are carbon taxing and the carbon sequestration with better standards and policies. (Lennart)

Carbon sequestration also called Carbon Capture and Storage (CCS) process is a long term process of storing and capturing the carbon dioxide from the flue gases generating in the industrial plants. Carbon sequestration method includes the storage of the carbon dioxide in the tanks before storing it in the underground reservoirs. The process can easily reduce the global warming. Carbon dioxide could be captured by various means or processes such as biological, physical, chemical processes. (Lennart)

Biological processes include peat production, reforestation, agriculture, iron fertilization and urea fertilization. Physical processes include bio-energy with carbon capture and storage, and landfills and ocean storage. Chemical processes include chemical scrubbers, acid neutralization and through carbon sequestration by mineral carbonation. (Lennart)

The carbon tax is the tax that is charged on the carbon content of the fuels. Carbon is almost present in every hydrocarbon fuels namely natural gas,

coal and petroleum. We already know that all hydrocarbons on upon burning in air or oxygen produce carbon dioxide gas that pollutes the climate. This can be minimized by using other methods or non-combustion energy sources e. g. wind, hydro power and the nuclear that not allowed carbon dioxide to produce. Scientists have pointed a tax on the emission of these gases that include carbon content. Carbon taxing method is cost effective method of reducing the emission of these gases. This is one of the types of the policy to reduce the emission of the gases that involve carbon content. (Lennart)

Cleaning coal technology is also a mean to reduce the effect of global warming. Clean coal technology encompasses the use of nuclear power plants instead of using the plants that involve coal fuels. Using nuclear plants is clean method as no carbon products are produced in it. So using nuclear power plants by replacing coal plants is an effective method to reduce pollution. (Lennart)

The two main strategies for mitigation are UNFCCC and GEF United Nations framework Convention on Climate Change UNFCCC is the international agreement on the climate changes. In 2010 all parties of UNFCCC approved that future global warming should be limited to below 2◦C that is relative to pre-industrial level. This target requires the annual global emission of greenhouse gases to peak before the year 2020 and then decline thereafter. United Nations Environmental programmed and International Energy proved these current policies too weak to achieve this temperature. Similarly, Global Environment Facility (GEF) is also helping in the climate change mitigation. It has six objectives, such as to use of low carbon technologies in industries, promotion of market transformation in industry, to promote investment in

energy renewable resources, to promote energy efficient or low carbon transport and urban systems, conservation enhancement of carbon stocks and the last one is to support all these activities. This strategy has three principles which are responsive to convention guidance, consideration of national circumstances of recipient countries, cost effectiveness in achieving global environmental benefits. GEF is trying to achieve low carbon development path through market transformation. (" Climate change mitigation,")

Many nations are working to stabilize the global climate. Similarly scientists have determined the solution to stabilize climate change. According to scientists 2 degree centigrade is the maximum limit. To avoid this limit that temperature should not rise from 2◦C relative to pre-industrial level. Therefore, we should limit the concentration of the carbon dioxide in the atmosphere. Some of the policies that must consider limiting this are world meteorological organization (WMO), Intergovernmental Panel on Climate Change (IPCC) and UN Framework Convention on Climate Change (UNFCCC). (" Climate change mitigation,")

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