Abstract for an Invited Paper
for the APR06 Meeting of
The American Physical Society

Negative Emissions Technology

DANNY DAY, EPRIDA

Although 'negative emissions' of carbon dioxide need not, in principle, involve use of biological processes to draw carbon out of the atmosphere, such 'agricultural' sequestration' is the only known way to remove carbon from the atmosphere on time scales comparable to the time scale for anthropogenic increases in carbon emissions. In order to maintain the 'negative emissions' the biomass must be used in such a way that the resulting carbon dioxide is separated and permanently sequestered. Two options for sequestration are in the topsoil and via geologic carbon sequestration. The former has multiple benefits, but the latter also is needed. Thus, although geologic carbon sequestration is viewed skeptically by some environmentalists as simply a way to keep using fossil fuels—it may be a key part of reversing accelerating climate forcing if rapid climate change is beginning to occur. I will first review the general approach of agricultural sequestration combined with use of resulting biofuels in a way that permits carbon separation and then geologic sequestration as a negative emissions technology. Then I discuss the process that is the focus of my company—the EPRIDA cycle. If deployed at a sufficiently large scale, it could reverse the increase in CO2 concentrations. I also estimate of benefits –carbon and other—of large scale deployment of negative emissions technologies. For example, using the EPRIDA cycle by planting and soil sequestering carbon in an area abut In 3X the size of Texas would remove the amount of carbon that is being accumulated worldwide each year. In addition to the atmospheric carbon removal, the EPRIDA approach also counters the depletion of carbon in the soil—increasing topsoil and its fertility; reduces the excess nitrogen in the water by eliminating the need for ammonium nitrate fertilizer and reduces fossil fuel reliance by providing biofuel and avoiding natural gas based fertilizer production.