

Global climate change has been linked to increased emissions of carbon-based gases, such as carbon dioxide and methane, that result from combustion of carbon-based fossil fuels, deforestation, and emissions from landfills, feedlots, and rice paddies. Global climate change has the potential to have catastrophic effects on local climate patterns and natural resources and is predicted to significantly increase sea levels, storm intensities, flooding, and drought conditions; as well as significantly alter wildlife habitat, agricultural planting zones, major ocean currents, biodiversity, and even whole ecosystems.

While the effects of climate change may be difficult to reverse, there are ways to potentially slow and mitigate climate change through reduction in carbon gas emissions and carbon sequestration. Additionally, innovative products and management practices can be employed to reduce the harmful effects to the global environment created by climate change.

Reduction of Carbon Emissions

Landfills are the leading source of methane in the United States. Methane is 20-25 times more concentrated than carbon dioxide as a greenhouse gas. Methane from landfills is principally generated from the organic fraction of waste materials that are deposited into our nation's landfills. While capture of methane emissions for energy conversion and combustion are classified as practices that reduce methane emissions and qualify for carbon credit trading scenarios, Filtrex International partners with private and municipal landfills and composting operations to prevent organic waste from reaching landfills. Once diverted, the organic waste is naturally bio-converted to compost, a process that does not generate methane as a byproduct, thereby preventing (rather than treating) the generation of methane from the leading source in the United States.

Filtrex International is the leading user of composted organic waste materials in the United States, using over 2,000,000 yds³/yr (1,000,000 tons/yr) of compost, equating to approximately 4,000,000 yds³/yr (4,000,000 tons/yr) of organic waste diverted from national and international landfills. How much methane gas is prevented by diverting this organic waste? One ton of organic waste generates approximately 196 yd³ of landfill gas, which is approximately 63% methane (124 yd³ or 64 kg of methane [some estimates are as high as 170 kg]) (Sakai, 2007). Therefore, 4,000,000 tons/yr of organic waste diverted from landfills prevents approximately 256,000 tons/yr of methane from entering the atmosphere. Once converted to the global warming potential in carbon dioxide equivalents this accounts to approximately 5,120,000 tons of CO₂e/yr.

Carbon Sequestration

Carbon sequestration is the act of removing carbon dioxide from the atmosphere and storing the carbon in carbon sinks, such as oceans, plants and other organisms that use photosynthesis to convert carbon from the atmosphere into biomass. Forest ecosystems and permanent grasslands are prime examples of terrestrial carbon sinks that sequester carbon. Filtrex International, through its erosion control, land reclamation, vegetation establishment and ecosystem enhancement programs, is responsible for approximately 7,500 acre/yr of permanent grass seeding using compost based technologies. The carbon sequestration rate for permanent grassing for the Western US = 0.4 tons/ac/yr of CO₂; and for the Eastern and Midwestern US = 1.0 tons/ac/yr of CO₂ (Chicago Climate Exchange, 2008). Ten percent (750 ac/yr) of Filtrex International's application of permanent grass seeding is applied in the Western US, 90% (6,750 ac/yr) of permanent grass seeding applications are in the Midwest and Eastern US. Total carbon sequestered per year (tons/yr CO₂) = 300 ton/yr in the Western US + 6,750 tons/yr in the Midwest and Eastern US, which equates to 7,050 tons of CO₂e/yr.

In addition to the carbon sequestered through permanent grass plantings, Filtrex International applies approximately 1,000,000 tons/yr of compost to terrestrial ecosystems and landscapes around the world through over 20 different environmental management practices and green products. These products are typically left on and in the soil, and are generally converted to stable soil carbon. Compost is typically 12.5% carbon (wet basis). This equates to approximately 125,000 tons of C/yr.

Environmental Management Under Global Climate Change

Filtrex International's compost based products and management practices have been researched, developed, and utilized in applications to: 1) reduce the effects of increased storm water quantity and localized flooding through collection and infiltration technologies; 2) limit the effects of increased pollutant transport, decreased storm water

quality, and degraded surface water quality through storm water volume reduction, filtration, and vegetation establishment and sustainability technologies; 3) protect and restore wildlife habitat and biodiversity through soil and plant ecosystem reclamation and sustainability applications; 4) reduce urban heat island effects, thereby reducing energy demand; 5) reduce transportation to end users, thereby reducing petroleum use and carbon dioxide emissions; 6) increase use of locally available materials and resources, thereby reducing energy demand from extraction and transportation; 7) increase use of bio-based materials, thereby reducing petroleum and other non-renewable resource use and demand; 8) protect against failure of levees and sand dunes, thereby preventing severe flooding; 9) improve crop and plant survivability during drought periods through increased water holding capacity; and 10) reduce water and irrigation demand during periods of mandated water conservation, prolonged drought, and drought prone regions.

Conclusion

The extent to which global climate change will affect society, economics, resources, culture, and our shared environment is widely debated and ultimately unknown. Filtrexx International recognizes that climate change is a reality and is doing its part to reduce carbon emissions, sequester carbon from the atmosphere, and provide green products and services that will mitigate the negative effects of climate change while also strengthening the sustainability, functionality, and resiliency of our ecosystems, the natural resources they provide, and the natural capital in which we all depend.

Filtrexx International is committed to reducing its overall carbon footprint towards a corporate goal of total carbon neutrality, as well as continually creating innovative new products and management practices to mitigate the negative effects of climate change on the environment across the globe. Filtrexx International is employing these technologies and applying its corporate goal in the United States, Canada, Japan, Australia, New Zealand, and the European Union.

References

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