Environmental Issues – Greenhouse Effect

The challenge facing today's society related to energy is the Greenhouse Effect. It is the rise in temperature of the Earth's surface due to the trapping of sun's energy within the atmosphere on account of increased presence of gases like carbon dioxide, nitrous oxide, methane and water vapour. Without these gases, heat would escape back into space and the Earth's average temperature would be about 60 °F lower.

The Greenhouse Effect is important. Without the greenhouse effect, the Earth would not be warm enough for humans to live. But when the greenhouse effect becomes stronger, it could make the Earth warmer than usual. A warmer Earth may lead to changes in rainfall patterns, a rise in sea level, and a wide range of impacts on plants, wildlife, and humans. When scientists talk about this issue of climate change, their concern is about global warming caused by human activities.

According to recent studies, the Earth's surface temperature has risen about 10 °F in the past century, with accelerated warming during the past decades. Most of the warming over last 50 years is attributable to human activities.

Since the beginning of the industrial revolution, atmospheric concentrations of carbon dioxide have increased 30%, methane concentrations have more than doubled, and nitrous oxide concentrations have risen by about 15%. These increases have enhanced the heat-trapping capability of the earth's atmosphere.

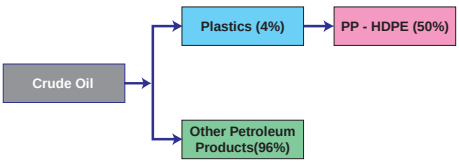
Fossil fuels burned to run cars and trucks, heat homes and businesses, and power factories are responsible for about 98% of carbon dioxide, 24% of methane and 18% of nitrous oxide emissions in the U.S. Increased agriculture, deforestation, land-fills, industrial production, and mining also contribute a significant share to emissions.

Plastics Help in Reducing Greenhouse Emissions

It is estimated that about 4% of the total energy consumption is used to produce plastic raw materials, including feedstocks.

This is quite a small percentage in comparison to energy's other uses. However, it is estimated that the use of plastics as a whole actually saves more oil than needed for their manufacture. Products made from plastics, including packaging, reduce our use of these resources (i.e., oil & gas) in the major consuming areas like energy & transport in many ways, e.g., food production is energy intensive, but minimizing food loss by packaging in plastics is preventing wastage of energy. In addition, it often takes less energy to convert plastics from a raw material into a finished product than comparable products. For instance:

- During their life cycle, plastic bags require about one-third less energy to make than paper bags.
- Foam polystyrene containers take 30 per cent less total energy to make than paperboard containers.
- 53 billion units of electricity is saved annually by improvements in appliance energy efficiency made possible by plastic applications. Without the benefits provided by plastics insulation, these appliances would use up to 30 per cent more energy.
- Studies show that the use of plastics in buildings can increase energy efficiency wherever insulation is done for air conditioning.
- Plastic woven sacks consume less energy for packaging of bulk commodities when compared to jute/paper bags for same applications.
- Plastic pouches consume one-tenth the energy for packaging and delivering milk compared to glass bottles.
- PVC pipes are much more energy efficient in terms of manufacture and usage over Gl/Cl pipes in water supply systems.



Plastics due to their unique properties of being light-weight, durable and malleable have enabled manufacturers and users to conserve energy in the production of various products like disposable cups, packaging films, automobiles, etc.

Plastics have been helping in the more efficient use of energy in applications in buildings, electric appliances, vehicles, and production processes. From production, through use and by waste management, plastics help conserve energy resources.

Without plastics, the energy used to produce packaging would double. A 1992 study found that by using plastic packaging rather than alternatives such as glass, paper or metal, American manufacturers saved 336 trillion Btu. This is a difference equivalent to 58 million barrels of oil, 325 billion cubic feet of natural gas or 32 billion pounds of coal. ("Packaging Without Plastics: Ecological and Economic Consequences from a Packaging Material Market Without Plastics," The Society for Research into the Packaging Market (Germany, 1992).)

Plastics are the material of choice because they make it possible to balance moderm day needs of higher efficiency with minimal use of fossil fuel resources - making it possible to use less but do more.

Lighter and stronger plastics use less space, requiring fewer vehicles to transport it to the supermarkets and reducing energy consumption. Plastic Shopping bags as compared to alternate packaging materials like paper bags weigh about 1/10th. A stack of 1,000 paper bags is 1.5 ft high and weighs 63 kgs while that of plastic bags is only 0.14 ft tall and weighs 7 kgs. There are significant savings in weight and volume reductions and resultant transportation efficiencies of about 85%.

The increasing use of plastics in the automotive sector also means vehicles are benefiting from their light-weight directly and this leads to fuel savings.

(contd. on page 8)