Optimizing Energy Conservation and Renewable Energy Initiatives towards Effective Pollution Control

ASHOK G. MATANI¹, S. K. DOIFODE²

¹Associate Professor - Mechanical Engineering, Government College of Engineering, AMRAVATI 444 604 (M.S.) India,
²Associate Professor – Chemistry, Government College of Engineering, AMRAVATI 444604(M.S.) India, Corresponding author: shamal.doifode@yahoo.com

Abstract

Energy conservation and pollution reduction go hand-in-hand, as the power plants that generate electricity often release arsenic, mercury, other metals and acid gases that threaten human health and the environment. Putting into practice a few simple, convenient ways to conserve energy will also help to trim utility bills. Not only does energy efficiency reduce or avoid greenhouse emissions, but it can also increase productivity and sustainability through the delivery of energy savings, and support social development by increasing employment and energy security.

Keywords: Consumption of energy, carbon polluting country, carbon emissions, national energy security, eco-friendly appliances

Present Status of CO2 Emissions from the Consumption of Energy

Table: 1- Total Carbon Dioxide Emissions from the Consumption of Energy (Million Metric Tons) [Some selected data]

<table>
<thead>
<tr>
<th>Name of the Region</th>
<th>Details for the year 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>North America</td>
<td>6,276.454</td>
</tr>
<tr>
<td>Central &amp; South America</td>
<td>1,399.469</td>
</tr>
<tr>
<td>Europe</td>
<td>4,262.526</td>
</tr>
<tr>
<td>Eurasia</td>
<td>2,657.049</td>
</tr>
<tr>
<td>Middle East</td>
<td>2,039.824</td>
</tr>
<tr>
<td>Africa</td>
<td>1,205.703</td>
</tr>
<tr>
<td>Asia &amp; Oceania</td>
<td>14,882.184</td>
</tr>
<tr>
<td>World</td>
<td>32,723.209</td>
</tr>
</tbody>
</table>

Effective Techniques to be Implemented

Here are some of the effective techniques and strategies to be implemented for achieving desired results.

* Choosing eco-friendly appliances
* Cutting heating and cooling expenditures
Optimizing Energy Conservation and Renewable Energy Initiatives towards Effective Pollution Control

* Switching to renewal energy sources
* Adopting reduce, reuse, recycle principle
* Expanding and modernizing the electric grid
* Cutting energy waste in homes, businesses, and factories
* Establishing a new goal for energy efficiency standards [Saidur R., Islam M.R., Rahim N.A.]

Some Novel Initiatives

Producing renewable fuels and chemicals from biogas and natural gas in Houston

Houston, Texas based Waste Management (NYSE: WM) Waste Management’s East Oak site in Oklahoma has formed a joint venture company to produce renewable fuels and chemicals from biogas and natural gas using smaller-scale Gas-to-Liquids (GTL) technology. [Masanet, Eric R., Richard E. Brown, Arman Shehabi, Jonathan G. Koomey, and Bruce Nordman]

Waste wood pyrolysis plant to produce bio-oil in Finland

Finnish sustainable energy company, Fortum had commissioned in Joensuu in Finland a new facility fast pyrolysis technology, in which wood biomass is rapidly heated in oxygen-free conditions produce around 50,000 tonnes per year of bio-oil from waste wood. As a result the biomass decomposes and forms gases that are then condensed into oil. This facility is the first of its type in the world, and has been integrated into its Joensuu combined heat and power plant. [Wang Lijun]

Effective Techniques to be Implemented

Choosing eco-friendly appliances

The Energy Star program to label products, such as appliances and electronics that utilize significantly less energy, while offering comparable quality to similar products. If the product costs more than non-Energy Star products, savings on energy bill typically make up for the price difference. Purchasing appliances with the Energy Star label will help to cut your energy costs and the pollution that accompanies high energy use.

Cutting heating and cooling expenditures

Sealing heat ducts can shave an additional 20 percent off on energy bill. Keeping the thermostat set at moderate temperatures in unused rooms, focusing heating and cooling expenditures on the rooms used the most effective option. In the summer, before switching on the air conditioning, using ceiling fans, window fans or open windows to keep cool while using less energy.

Switching to renewal energy sources

Increasingly, homeowners have the opportunity to purchase all or part of their electricity from a supplier that uses green or renewal energy sources, such as solar or wind.
Adopting reduce, reuse, recycle principle
Recycling also saves energy and reduces pollution. Recycling also diminishes the need for harvesting or mining virgin materials, activities that can damage the environment and cause pollution

Expanding and modernizing the electric grid
Upgrading the country’s electric grid is critical to our efforts to make electricity more reliable, save consumers money on their energy bills, and promote clean energy sources.

Cutting energy waste in homes, businesses, and factories
Energy efficiency is one of the clearest and most cost-effective opportunities to save families money, make businesses more competitive, and reduce greenhouse gas emissions.

Establishing a new goal for energy efficiency standards
In U.S., the Department of Energy had established new minimum efficiency standards for dishwashers, refrigerators, and many other products. Through 2030, these standards will cut consumers’ electricity bills by hundreds of billions of dollars and save enough electricity to power more than 85 million homes for two years.

Conclusions
With the growth of energy consumption, energy-related environmental pollution has become increasingly serious, which in turn causes enormous economic loss because of public health damage, corrosion of materials, crop yield reduction, and other factors. Various effective strategies to be implemented includes implementing national policies and measures for promoting electricity generation with renewable energy, reducing transport demand and shifting transport modes, reducing process-related emissions from industry, and advancing sustainable agriculture. The need of the day is to effective utilize the most efficient techniques towards environment protection. This paper attempts to discuss various techniques and strategies for controlling energy related environmental pollution in industries in different parts of the world.

References


