



Strategies to Reduce Global Warming through Engineering

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Promoting energy saving culture is another alternative source of energy for the planet

In order to manage the obligatory actions needed to revert the ecological damage produced by greenhouse gases emissions, released to the atmosphere that rise global warming, it is unavoidable to take measures that contribute to the mitigation of this phenomenon. One of the most effective ways to achieve transcendent and immediately effective results, is the application of energy saving actions and in parallel, having in mind the medium and long terms, incorporate sources of renewable energy and new zero emission energy production technologies. In this way, the final objective of ending combustion of fossil resources may be possible.

Considering that a short term look should encourage the growth of energy saving through high impact actions, with a priority that allows the energy sector to delay investment in generation, consume less equivalent oil barrels, and avoid the emission of millions of tons of polluting gases into the atmosphere. This proposal offers benefits to society and has a significant dimension, since it means the diminishment of energy consumption to users, especially to low income communities, decreases subsidies applied in electricity tariffs, increases competitiveness of enterprises and thus, promotes the generations of jobs.

We must point out that the global warming phenomenon has put on the discussion table the need to analyze and evaluate the impact that energy production and consumption patterns have, due to the importance of fossil resources in the total offer of primary energy in the world. At world level, almost 70% of the total emissions of Greenhouse Gases (GHG) effect are relative to energy uses, of which, 24% correspond to the generation of energy, 14% to the industrial sector, 14% to the transportation sector, 8% to the residential and commercial sectors, and the balance to other uses. This fact



renews an old discussion that emphasizes a dichotomist vision between development and environment, due to the fact that energy is a crucial element for the economic and social development of any country. For this reason the pursuit of alternatives that imply a better relationship between energy and the environment, turns to be a strategic measure to achieve a true sustainable development.

In the American Continent there is a scenario characterized by two realities. On one side, the United States appears as a Country whose traditional energy production and consumption have a substantial environmental impact, since more than 24% of the total GHG in the world is emitted by this Country. On the other hand, the rest of the countries in the Continent contribute 3.2% of the world total emissions of GHG. Even so they do not contribute in a significant way; it is also true they can not leave aside the principle of co-responsibility that implies assuming the part that belongs to them in this problem. In this way, energy and sustainability turn out to be a binomial that will mark in many aspects, the development policies of all the countries in the immediate future.

With this vision it seems unavoidable, that under a regional perspective, the different governments of The Americas should establish a political agenda that allows the evaluation of the dimensions that the topic of energy and sustainability requires; in such a way that strong measures directed to mitigate the climate change may be implemented. In this way, the evaluation of the Intergovernmental Panel on Climate Change (IPCC) of the United Nations, in which it has been confirmed that policies well designed and market oriented, are capable of integrating economic, social and environmental objectives necessary for the sustainable environmental development of any country.

It is here where science, engineering and technological innovation, should have a preponderant and decisive role for the achievement of these objectives. It is therefore necessary to open a space for discussion and knowledge exchange, where the strengths and weaknesses that the different countries in the American Region have in their energy systems, technology innovations and practices they are developing, as well as the role of their governments on the implementation of sustainable energy policies. It is urgent to implement an action plan that covers the following areas:



Energy Efficiency. In the short term, energy consumption of the different productive sectors is one of the areas with the biggest savings and energy efficiency potential. In the Industrial Sectors, for example, the replacement of existing equipment with the more efficient technological options, as well as the implementation of new productive processes, are only some of the options that may be able to achieve important goals in saving and energy efficiency. In the same way, the residential and commercial sectors may adopt more efficient energy technologies, like the integrated design of “intelligent buildings”, bioclimatic architecture, and use of new materials for refrigeration and heat insulation, as well as refrigerators, freezers and more efficient heating systems. Efficiency of electric power generation plants may significantly increase, mainly with the use of combined cycle turbines, since the new models have conversion efficiency close to 60%.

Renewable energies Use. The renewable energy technologies, such as the solar, wind, as well as small hydroelectric plants, may significantly reduce the emissions of Greenhouse Gases. The use of wind power generators is growing an annual rate of 25% world wide. Solar energy and biomass are energy options also growing since the costs of production show a decreasing trend. Total contribution of renewable energy sources, excluding large hydroelectric is presently under 2% at a the world level, but by 2010, more efficient photovoltaic sources are expected and ethanol based bio-fuel can penetrate the market, wind power plants placed off shore with a larger electricity production capability, as well as other types of low or zero emission fuels.

“Green” (clean) technologies on energy production. The nuclear energy plants, as well as the new technologies for energy production consisting in the capture or sequestering of carbon dioxide, represent one of the main options that the developed countries have to diminish their emissions of GHG. In the Latin American context, especial attention should be pay paid to this topic, since the development and technological innovations may turn into a true central point for growth that allow developing countries to reach their energy security to comply the objectives of a true sustainable development.



Climate change is being aggravated by the human contribution to satisfy their energetic requirements through the combustion of organic and fossil materials that also generate deforestation of large extensions of green areas which exacerbate the problem by the diminishment of the natural source of carbon dioxide capture.

Science, technological development and engineering constitute the central axis through which the political and economic decisions should pass in order to solve this problem strictly technological in nature.

The Academy of Engineering of Mexico, Pan American Federation of Engineering Societies and the Mexican federation of Engineering Societies call the scientific, academic and engineering communities, to submit actions that may lead political leaders and economic entities to take the necessary, urgent short, medium and long term decisions in order to mitigate the climate change and guarantee a sustainable development.