



BIOFUELS DEVELOPMENT: NEW AREAS FOR RESEARCH.

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The international community (universities, governments, companies, NGO, etc.) finally has recognized the enormous impact that increased emissions of greenhouse gases will have in the medium and long terms on the development and survival of our planet. So the research areas for new sources of energy (products and processes) are being reviewed with a much broader scope and perspectives, including not only technical and economic feasibility but taking into account environmental impacts and possible consequences of their massive use.

In this presentation I will review in particular the new approaches and criteria that are being proposed to evaluate projects for production of first and second generation biofuels, which include life cycle assessment studies and the impact that might have the use of new areas for cultivation on the environment (land use change). Also I will comment briefly on the new scientific trends that have arisen more recently, for example the development of bioenergy-crops. Most of the comments are based on the published data of what is happening in the United States, Brazil, European Union and few other countries, unfortunately in Mexico and other Latin American countries the situation of biofuels is still uncertain with regard to priority and importance.

The main purpose of the analysis was to identify the new areas of research that now are required to carry out research and development projects on biofuels, and also how the integration of multidisciplinary groups will change the goals and perhaps the selection of technical options.

In particular the following issues will be discussed in more detail and some examples will be shown:

- Production of new feedstocks (bioenergy crops) for bioethanol, biodiesel and others biofuels.
- Different technological routes for bioethanol production (biochemical and thermo chemical processes).
- Perspectives of new biofuels in the second generation stage (biodiesel from algae and biobutanol from lignocellulosic residues).
- State of development of commercial scale projects of second generation bioethanol in USA.
- Requirements related to environment, which include life cycle assessment studies (covering greenhouse gas emissions and energy analysis).
- New regulations being proposed in USA and European Union related to biofuel production (land use change, indirect land use change and its impact in the level of greenhouse gas emissions).
- Studies on the social impact of introduction of biofuel production in countries with a strong tradition in agriculture.

Now it is required a wider approach with a holistic view for research projects on biofuels, and this implies that the research groups must be multidisciplinary in nature to cover the new areas of research and at the same time there is strong need to collaborate and interchange views and results in order to carry out projects with higher probabilities of success.