



Center for International Development at Harvard University
Sustainability Science Program
John F. Kennedy School of Government



**Ministry for the Environment,
Land and Sea**

DEPARTMENT FOR ENVIRONMENTAL RESEARCH AND DEVELOPMENT

Grand Issues in Sustainability
Biofuels and Sustainable Development

May 19-20, 2008

VENICE INTERNATIONAL UNIVERSITY
San Servolo Island
Venice, Italy

The Italian Ministry for the Environment, Land and Sea and Harvard University in March 2006 launched a joint program to support scientific research into sustainable development and to train high-level government officials and experts in developing countries.

As part of this project, the ministry set up the Fund for Sustainable Development to finance courses and research programs at the Center for International Development of the John F. Kennedy School of Government, one of the world's most prestigious university centers for research into sustainable development and the fight against global poverty.

The main theme of the 2008 research program is the role biofuels can play in the global economy to combat poverty, reduce greenhouse-gas emissions and contribute to energy security.

World energy demand will rise 50% by 2030 compared with 2005.

According to the International Energy Agency (IEA), fossil fuels will cover more than 85% of energy demand growth and over \$20 trillion will be invested in the next 25 years on oil and gas exploration as well as the construction of power plants and other infrastructure needed to meet demand, much of it in emerging economies.

A residual amount will be spent developing alternative energy sources.

Considering that the average life of power stations and energy infrastructure is between 30 and 50 years, these investments will determine the global future for energy and the environment.

Higher energy consumption is due to trigger a 55% jump in global CO₂ emissions compared with current levels.

This outlook is in line with some of the worst-case scenarios depicted in 2007 by the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC), which said that worldwide carbon-dioxide emissions should fall by at least 50% in 2030 compared with current levels to ensure the protection of climatic systems.

Steering the global energy trend towards lower carbon intensity will mean developing and using alternative sources to fossil fuels as well as high-efficiency technologies – by 2030.

Given the need for urgent and effective measures in the short term, existing resources and technologies must be fully exploited and investments focused on those alternative energy sources and technologies that promise quick results.

In this context, bioenergy and biofuels in particular represent a readily available option that can ensure both immediate solutions and further technological developments in a relatively short timeframe. They can

- help diversify energy sources and boost energy security;
- significantly reduce the carbon content of energy use, depending on which types of fuel and technologies are employed (bioenergy is therefore classified as a renewable energy source);
- benefit in the short to medium term from important innovative developments in the biotechnology and energy sectors with the use of all cellulose-based organic material for the production of bioethanol.

The outlook is very favorable for the development of biofuels in the short to medium term.

The IEA estimates they could cover about 8% of world demand for liquid fuels by 2030 thanks to a fourfold jump in consumption from current levels (to 36 million metric tons of oil equivalent from 8 Mtoe).

But according to forecasts of various scientific institutes and international agencies, potential world biofuel production in the short to medium term is much higher. In 2030, biofuels could meet 20% of demand, rising to 30-40% in 2060.

In the near future, there is great potential for bioethanol production from sugar cane in tropical areas, where there are enormous uncultivated marginal lands.

These areas are also where the planet's poorest countries are located and therefore represent a potential source of wealth and development if they are turned over to energy crops: the barriers to this kind of development don't lie in production costs but in a convergence between the interests of the global oil industry and the protectionist policies adopted by the U.S. and the European Union, which subsidize internal agricultural production while imposing import tariffs on other countries.

Apart from subsidies and tariff barriers, biofuel development is influenced by possible competition with the conservation of natural resources and agricultural food production.

1. ***To be compatible with the conservation of natural resources, many factors must be taken into consideration, including***
 - ***the use of land for the production of biofuels***, with particular reference to changes in land use of virgin forest and high-carbon content peatland;
 - ***biofuel production techniques*** in terms of fertilizer use, soil erosion, consumption of surface and ground water;
 - ***the overall impact on net carbon-dioxide emissions*** both during production and conversion.
2. ***Food security means being aware of the ways that rural and poor populations have access to agricultural products and making sure this is not compromised by bioenergy production.***

Energy markets are much larger in value terms than agricultural markets.

As a result, energy prices will tend to influence the cost of agricultural products that can be used to make energy.

Rising prices for bioenergy feedstocks, especially when accompanied by subsidies, benefit producers but have a negative impact on those needing them for food, especially the rural poor.

In the near term, the sale of raw materials for the production of bioenergy on internal or international markets should be allowed only after guaranteeing basic criteria for food security.

In the medium term, the conflict between food security and energy production should be resolved by the use of marginal land that doesn't compete with food crops combined with biotechnology solutions and the development of second-generation biofuels.

A global biofuel commodity market will emerge once tariff and trade barriers are overcome and potential conflicts with natural resources and food security correctly managed. This will bring two results:

- the availability at competitive prices of alternative energy sources to fossil fuels;
- the growth of a sustainable, global bioenergy economy benefiting poor, raw-material producing countries.

One last aspect must be underlined: a global and sustainable biofuels commodity market, backed in part by the development of biotechnology for second-generation ethanol and biodiesel, will tend to shift the geography of the global energy market and challenge the petroleum economy. This may turn out to be the biggest challenge.

The high-level international scientific workshop organized by the Center for International Development of the John F. Kennedy School of Government at Harvard University and the Department for Environmental Research and Development of the Italian Ministry for the Environment, Land and Sea will be dedicated to the prospects for biofuels as an “engine” of sustainable development.

The workshop will take place at Venice International University, on San Servolo island in Venice, Italy.

Despite the strictly scientific and confidential nature of the workshop and in view of your focus and expertise on the subject matter, we are happy to invite you to a meeting between a selected group of international journalists and our experts at the end of the first day of the workshop.

William Clark

Corrado Clini