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**THE EMERGING BIOFUELS MARKET:
REGULATORY, TRADE AND DEVELOPMENT IMPLICATIONS**



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EXECUTIVE SUMMARY

The sharp increase in the price of petroleum products, the finite nature of fossil fuels, growing environmental concerns, especially related to greenhouse gas emissions, and health and safety considerations are forcing the search for new energy sources and alternative ways to power the world's motor vehicles. Biofuels – fuels derived from biomass – may offer a promising alternative. Some analysts estimate that substituting by 2020 up to 20 per cent of mineral fuels consumed worldwide with biofuels is a feasible option.

Several developed and developing countries are establishing regulatory frameworks for biofuels, including blending targets. They are also providing different kinds of subsidies and incentives to support nascent biofuel industries. These developments are expected to spur a sustained worldwide demand and supply of biofuels in the years to come.

Increased production, use and international trade of biofuels may slow down the process of global warming and provide an opportunity for developing countries to diversify agriculture production, raise rural incomes and improve quality of life. It may enhance energy security and reduce expenditure on imported fossil energy.

Efficiency considerations indicate that feedstock and biofuel production has to take place in the most efficient countries. Several developing countries – with land to devote to biomass production, a favourable climate to grow them, and low-cost farm labour – already are or may become efficient producers. Energy security considerations, however, may prompt less-efficient countries to engage in biofuel production irrespective of economic and environmental considerations.

Ethanol features today as a very dynamic commodity with international trade recording a strong growth. Developing countries, particularly Brazil, have benefited from that dynamism, including by taking advantage of existing preferential trade arrangements. South-South trade and transfer of technology are taking place. Conversely, there appears to be little international trade in ethanol feedstocks. Subsidies are likely to contribute to the expansion of domestically produced feedstocks in developed countries.

Biodiesel production outside of the EU is still limited and this explains the absence of significant international biodiesel trade. Recent heavy investments in several countries indicate that production and international trade are poised to grow. Trade in biodiesel feedstocks is on the rise: the traditional structure of the plant-oil industry may also explain this trend.

International trade in biofuels and related feedstocks may provide win-win opportunities to all countries: for several importing countries it is a necessary precondition for meeting the self-imposed blending targets; for exporting countries, especially small and medium-sized developing countries, export markets are necessary to initiate their industries. Nevertheless, biofuels face tariffs and non-tariff measures. This can offset lower production costs in producing countries, represent significant barriers to international trade, and have negative repercussions on investments in the sector. Moreover, export performance is often penalized by the graduation of the successful exporting countries from the preferential schemes. A more liberal trade regime would greatly contribute to the achievement of the economic, energy, environmental and social goals that countries are pursuing.

With a considerable increase in trade in feedstocks and biofuels expected, sustainable production is becoming a key concern and is currently being considered as a possible requirement for market access. Certification and labelling of biofuels and feedstocks remains, however, a complex issue. Unnecessary trade barriers can be avoided by a fair criteria-development process characterized by widespread participation, transparency, and consideration of certification capacity building in developing countries.

Some specific challenges for developing countries include: (i) avoiding diverting too much land from food production to energy crops; (ii) avoiding sharp rises in the prices of food, especially for net-food importing developing countries; (iii) finding ways to ensure that small farmers do not face

undue barriers to participation in the sector; (iv) and gaining access to relevant energy technology, including advanced technologies that are expected to reap greater environmental benefits. Conscious decisions, sharing of information and data collection, organizational strategies, government support services, technical and financial assistance will be necessary to minimize the risks and enhance the benefits that emerging biofuel markets may present to developing countries.

UNCTAD, through its BioFuels Initiative, is providing developing countries with access to economic and trade policy analysis, capacity-building activities, and consensus-building tools to help them address those and other challenges.

INTRODUCTION

The era of "easy" energy is over. Governments, intergovernmental organizations, corporations, NGOs and even individuals are asking themselves a number of questions that are crucial for the sustainable development prospects of all countries. How do we meet the world's energy needs? What role will renewable and alternative energies play? What is the best way to combat climate change? How do we accelerate improvements in energy conservation? How can developing countries best exploit the opportunities for diversification and new markets offered by the changing energy equation? Alternative energy sources, including biofuels, may form part of the answers to these questions. While alternative energy sources grow faster than any other energy source, they still account for a very limited share of primary energy demand, therefore they are not expected to replace fossil fuels but to play a complementary role in satisfying world energy demand.

Section 1 of this study analyses recent developments in international energy markets. Sections 2 and 3 address market, regulatory developments and tariff regimes for biofuels in a number of developed and developing countries, while section 4 deals with the technological prospects of the biofuel industry. Section 5 addresses the issue of subsidies. Subsequently, the study focuses on the opportunities that emerging biofuel markets may offer, especially to developing countries, in terms of diversifying energy sources and reducing dependence on fossil fuels, mitigating climate change effects, increasing markets for agriculture products and enhancing the participation of rural communities in economic activities. Biofuels, however, raise some basic concerns. The actual and potential challenges and opportunities, especially for developing countries, are analysed. Section 7 presents some data on trade flows for biofuels and related feedstocks. Section 8 deals with some specific WTO issues which may have direct implications for biofuels. The last section of the study illustrates UNCTAD's present and forthcoming activities under the BioFuels Initiative and the overall role that the organization is planning to play as an international hub for biofuels.

1. THE PRESENT ENERGY SCENARIO

The global economy depends to a large extent on energy derived from fossil carbon sources, mainly oil, coal and increasingly natural gas. Fossil fuel resources are finite, but not yet near to exhaustion. It is estimated that 970 billion barrels of oil have been consumed so far, while around 1400 billion barrels are still to be extracted, which should take not more than 30 years at the current rate of production. An additional crucial problem is oil production capacity, which may peak in the next 5 to 15 years before starting to decline.¹

The International Energy Agency (IEA) has a different perspective. Its latest analysis indicates that global primary energy demand is set to increase by 1.6 per cent per year from 2005 to 2030, driven mainly by transport. The projected growth is, nevertheless, slower than growth over the past three decades, which ran at 2.1 per cent per year. Fossil fuels will remain dominant, accounting for more than 80 per cent of the projected increase in primary energy demand to 2030. Natural gas demand will grow fastest, but oil will still be the largest individual fuel source. Members of the Organization of the Petroleum Exporting Countries (OPEC), especially in the Middle East, will meet most of the demand growth. Though renewable forms of energy will expand rapidly, they start from a small base and cannot displace fossil fuels as the over-riding source of energy in this timescale.²

Recent oil price increases, although stemming largely from other factors, provide a glimpse of a likely future of rising oil prices due to escalating extraction costs as increasingly marginal resources

¹ Estimation by the Association for the Study of Peak Oil and Gas, *ASPO Newsletter*, April 2006 found at: http://www.peakoil.ie/downloads/newsletters/newsletter64_200604.pdf, visited on 3 May 2006.

² IEA, *World Energy Outlook 2005, Summary*, found at: <http://www.iea.org/textbase/npsum/WEO2005SUM.pdf>, visited on 22 March 2006.

have to be exploited. Since exploitation of those resources is also often associated with more challenging environmental consequences, the incentives to reduce oil consumption are clearly strong.

While petroleum continues to dominate the fuel mix of developed countries, oil consumption has declined in all sectors except transport since 1973. The fall in oil consumption was particularly strong in manufacturing and electricity generation, a result of both fuel switching and a strong decline in energy use per unit of output. The decline in oil demand in stationary sectors was sufficient to offset the growth in transport oil demand, so that in 2001 oil demand levels in the Organization for Economic Co-operation and Development (OECD)'s countries were comparable to those in 1973.³ At the global level, however, oil demand reached 80 million barrels per day in 2004 from 56 million barrels per day in 1973, due to increased consumption in non-OECD countries.⁴

Fossil fuels have provided the world with a means for transportation, lighting, heating, cooking, manufacturing and information. They have greatly contributed to overall development, economic growth, employment and communication. They have, however, also had high environmental costs. According to some estimates, carbon dioxide levels in the atmosphere are 30 per cent higher than the highest levels registered during the last 400,000 years⁵ with proven adverse climate impacts and associated social and economic costs. If current government policies do not change, energy-related emissions of carbon dioxide are projected to increase by 1.6 per cent per year from 2003 to 2030, reaching 37 billion tonnes in 2030, as compared with 24 billion tonnes in 2005.⁶ Therefore, irrespective of the supply-demand situation, continued utilization of fossil fuels is, and will increasingly become, a source of atmospheric carbon concentrations. This will be unsustainable from an environmental and economic point of view.

Most agree that the energy challenge of this century – providing the affordable energy needed to achieve, expand, and sustain prosperity for all while avoiding intolerable environmental disruption – cannot be met without a huge increase in the global energy-innovation effort. While it would be unrealistic to think that new energy sources could solve all the energy problems that countries face at present, their development may contribute to alleviating climate change-related problems and lessening the dependence of energy-importing countries on fossil fuels. Exploring the potentialities of alternative energy sources would thus be suitable in economic, environmental, strategic and political terms. In addition, efforts should be deployed to achieve a more sustainable path of energy consumption through efficiency gains and demand-side management.⁷

³ IEA, *Oil 2006: A Critical Review*, 2006, p. 10. ⁴ IEA, *Oil 2006: A Critical Review*, 2006, p. 10. ⁵ IEA, *Oil 2006: A Critical Review*, 2006, p. 10. ⁶ IEA, *Oil 2006: A Critical Review*, 2006, p. 10. ⁷ IEA, *Oil 2006: A Critical Review*, 2006, p. 10.

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