The Current State of Bioenergy Policies and Development

GBEP side event

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BIOENERGY: Main Benefits

- **Sustainability**: clean and renewable energy source
- **Availability**: increased energy access - rural areas
- **Flexibility**: power, heat and transport
- **Energy security**: diversified energy mix, domestic sources
- **Mitigation of climate change**
- **Diversification** of rural livelihoods
- **Reduction in land degradation**
BIOENERGY: Key Challenges

- Ensuring sustainability
- Safeguarding food security
- Protecting biodiversity
- Managing competition for land and water
- Controlling pollution of air, water and soils
- Removing barriers to bioenergy trade
ENERGY SECURITY
and
CLIMATE CHANGE
WORLD PRIMARY ENERGY DEMAND
(Reference Scenario WEO 2007)

Source: Reference Scenario WEO, IEA 2007
Where is renewable energy used today?

Mostly solid fuels used by nearly 1,500 million people who live without access to reliable sources of energy.

OECD members
5 885 000 TJ
- 39% industrial
- 33% residential
- Third-party sales
- 1% heat
- 7% electricity
- 13% CHP

Rest of world
38 076 000 TJ
- 9% industrial
- 77% residential
- Third-party sales
- 0% heat
- 1% electricity
- 0% CHP

* Other bioenergy consumption includes non-industrial agriculture, forestry, fisheries, commercial applications and transport (not including liquid biofuels for transport).

Sources: IEA 2006a; 2006b.
Energy mix in China and India

Growth in primary energy demand: China 3.2%, India 3.6%
Energy related CO$_2$ emissions by region

Cumulative emissions

- United States: 30%
- European Union: 23%
- China: 8%
- Japan: 4%
- India: 2%
- Rest of the world: 33%

Source: Reference Scenario WEO, IEA 2007
Life Cycle Analysis to estimate GHG balances

- Iso 14040 Life cycle assessment
- Biomass-based climate change mitigation through renewable energy systems (Biomitre)
Process chain: Sorghum life cycle inputs

Ensure environmental best practices at all stages of the biofuel process chain.

McClaren et al. 2002

Net energy gain = 26,000 Btu/bu

- Ethanol
- Cultivate
- Fertilize
- Chemicals
- Irrigate
- Harvest
- Transport
- Process
- Delivery
- DDGS credit
Food Security
World population: 1750 – 2050

Total population (billions)

Annual increments (billions)

Source: UN, 2003
Developed market economies

Countries in transition
Sub-Saharan Africa
Near East and North Africa
Latin America and Caribbean

Developed market economies
9

Countries in transition
25

Sub-Saharan Africa
206

Near East and North Africa
38

Latin America and Caribbean
52

Asia and Pacific
524

854 million
(820 in developing countries)

Where is land available?
Where is the energy deficit?

212 million India
150 million China

Undernourished

854 million
(820 in developing countries)
Arable land

1,381 million ha (766 in developing countries)

Developed market economies
368

Asia and Pacific
400

160 million India
137 million China

Countries in transition
247

Latin America and Caribbean
142

Sub-Saharan Africa
152

Near East and North Africa
72
Developed market economies
9,864 kWh/capita

Countries in transition
3,183 kWh/capita

Sub-Saharan Africa*
347 kWh/capita

Near East and North Africa
3,438 kWh/capita

Asia and Pacific
1,282 kWh/capita

Latin America and Caribbean
1,454 kWh/capita

Average 3,261 kWh/capita globally;
1,630 kWh/capita in developing countries

* Figure is underestimated as IEA does not report information for 18 of 39 countries
Bioenergy and food - Crop prices

Figure 1.7. **Outlook for world crop prices to 2016**
Index of nominal prices, 1996 = 1

Source: OECD and FAO Secretariats.
The contribution of FAO
- **IBEP – International Bioenergy Partnership**
  Comprehensive framework with the identification of national, regional and global bioenergy task forces as implementation instruments

- **BIAS – Bioenergy Impact Assessment**
  Analytic framework for assessing environmental impacts of bioenergy development

- **BEFS – Bioenergy and Food Security**
  Analyze linkages between bioenergy potentials and food security risks

- **Bioenergy Programme Facility**
  Mechanism for coordinating direct assistance to countries, guidelines, data, country analysis

- **GBEP – Global Bioenergy Partnership**
  International initiative bringing together public, private and civil society stakeholders. GBEP is committed to promote bioenergy for Energy Security, Food Security, Sustainable Development. FAO is a Partner and hosts the GBEP Secretariat. FAO guided the development of the first GBEP Report, released on 13 November 2007.
GBEP REPORT: "A REVIEW OF THE CURRENT STATE OF BIOENERGY DEVELOPMENT IN G8 +5 COUNTRIES"

CONTENTS:

- Bioenergy in the global energy context
  Bioenergy overview
  Bioenergy contribution to the world energy supply
- Policy Overview
  Policies across countries
  Regional policies
  Sustainability and Trade considerations
  Bioenergy consumption in G8 +5 Countries
- Country profiles and bioenergy data for G8 +5 Countries
- Regional profiles
  EU, NAFTA, APEC, ASEAN, MERCOSUR, CBI, CAFTA
- Data sources, terms and conversion factors or bioenergy
POLICY OVERVIEW:

- **Principal policy mechanisms** being deployed (Feed-in tariffs, taxes, guaranteed market, compulsory grid connections, other direct supports and R,D&D)
- **National targets** and public incentive systems
- Government’s current move towards **performance focused policies** (GHG reduction required rather than mandate an amount of fuel to be consumed)
- Recognition that **not all biofuels are “green”**. International sustainability assurance system exists. Sustainability requirements need to be agreed upon internationally.
- WTO does not currently have a trade regime specific to biofuels. The current move towards **harmonization of technical standards** regionally and internationally is addressed.
Growth in bioenergy needs to be carefully managed if we are to make the most of its benefits and resolve its challenges.

Sustainability is a key objective and it is wise to ensure sustainability management of the entire chain.

Methodologies to measure GHG emission reduction from the use of bioenergy are essential for climate change mitigation.

Second-generation biofuels are likely to provide large amounts of biofuels and only within the next 10/15 years.

Capturing the full potential of biofuels means overcoming environmental and social constraints and removing trade barriers.