

# 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**

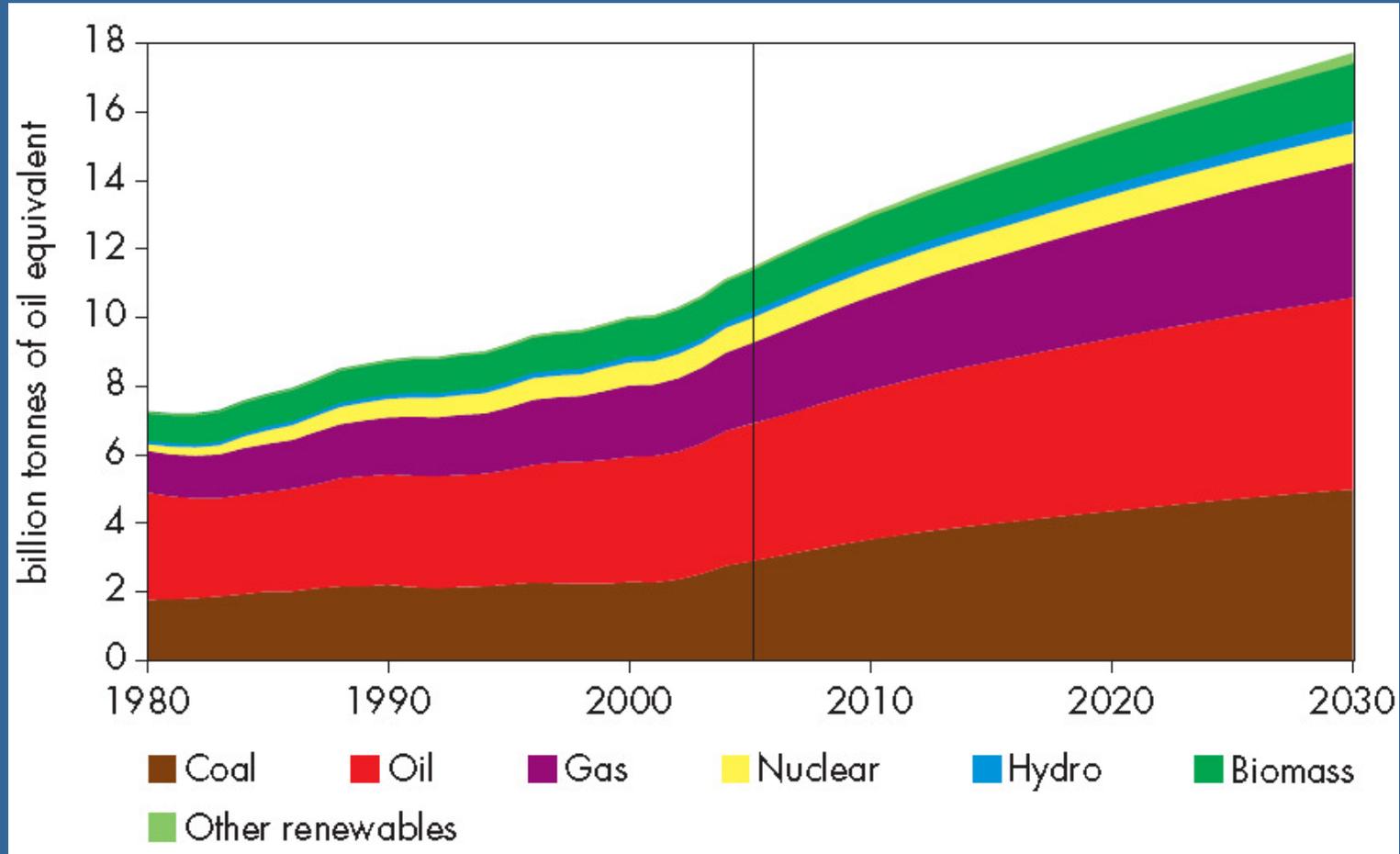
# BIOENERGY: Key Challenges

- 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**

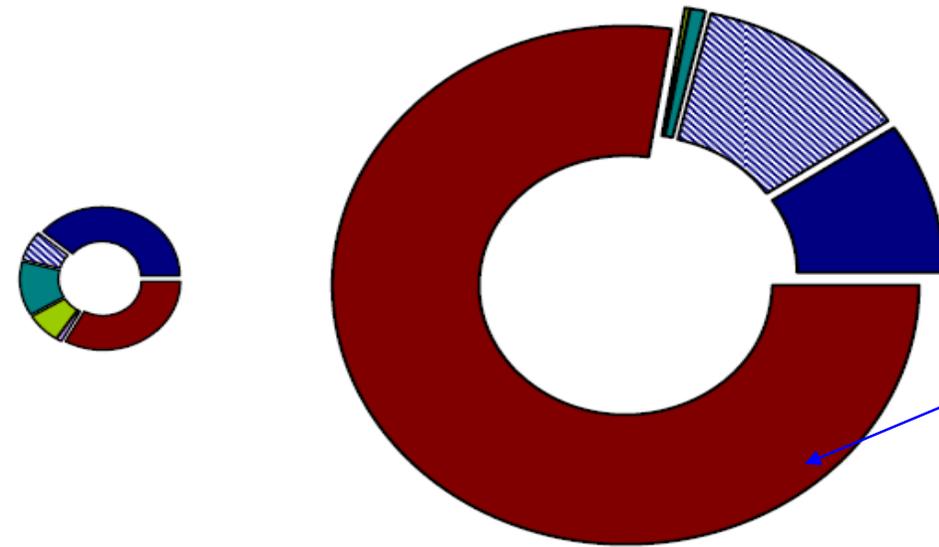
# WORLD PRIMARY ENERGY DEMAND

(Reference Scenario WEO 2007)



Source: Reference Scenario WEO, IEA 2007

# Where is renewable energy used today?



**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

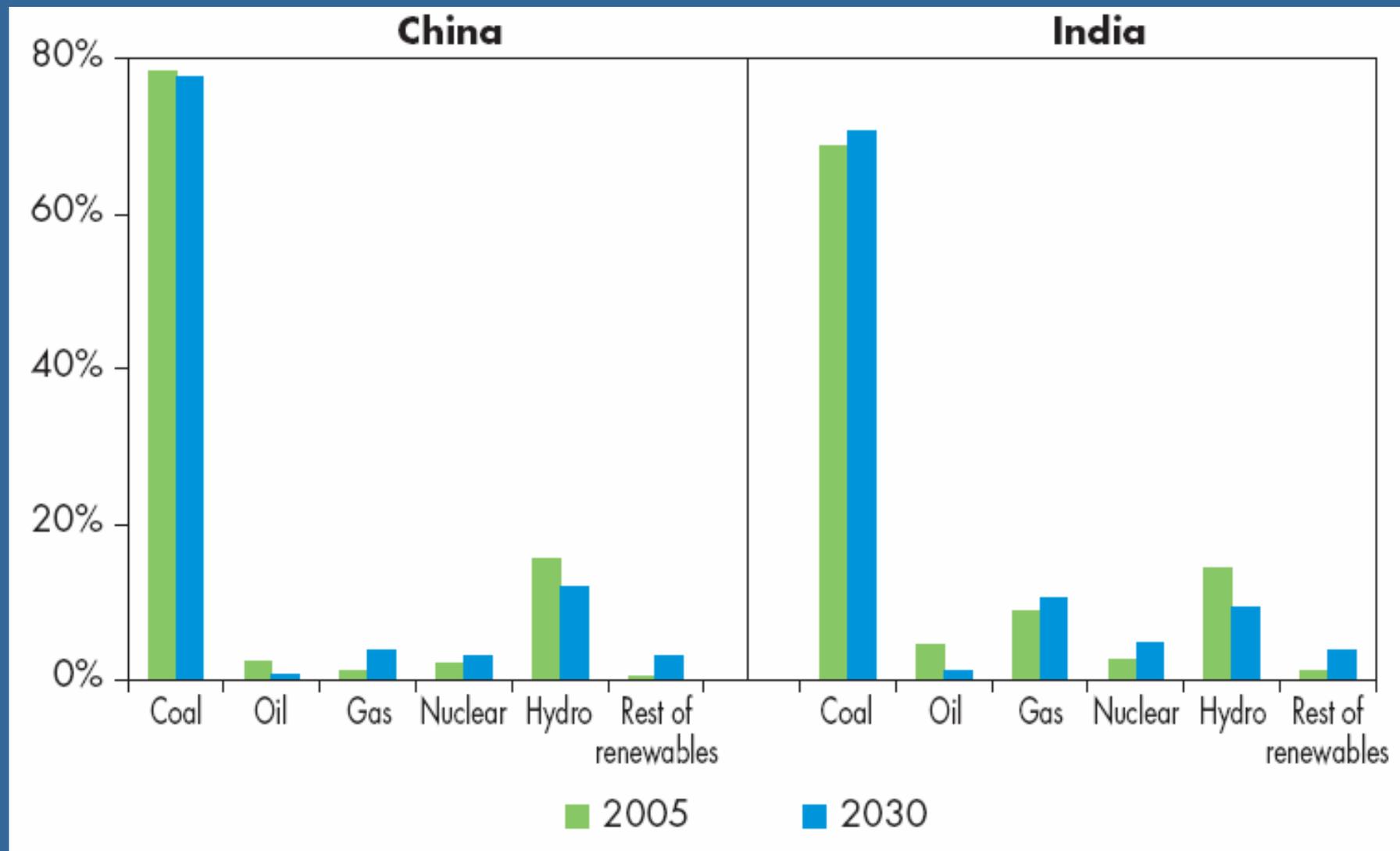
■ *Third-party sales*  
■ 0% heat  
■ 1% electricity  
■ 0% CHP

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

Sources: IEA 2006a; 2006b.

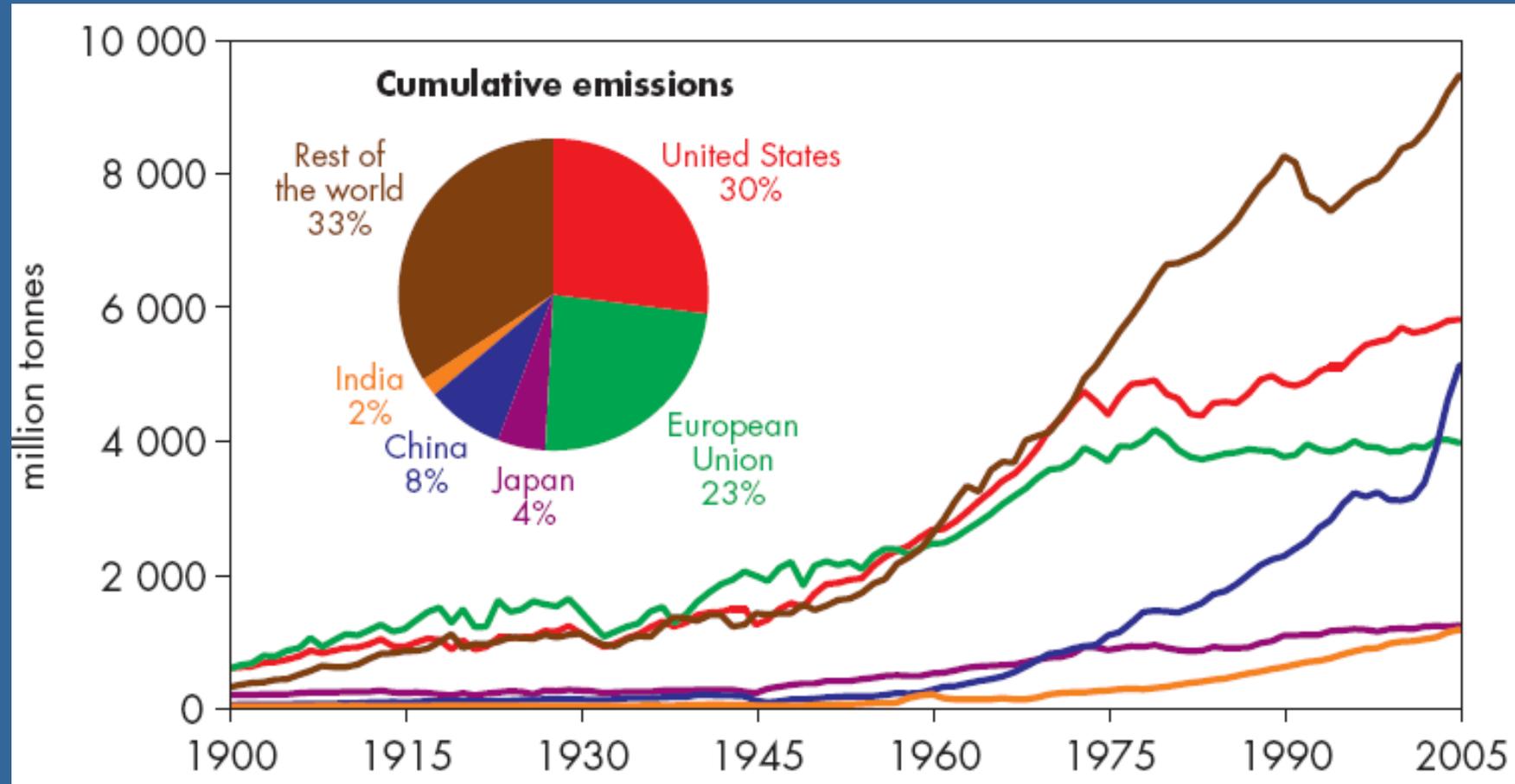
Mostly solid fuels used by nearly 1,500 million people who live without access to reliable sources of energy

# Energy mix in China and India

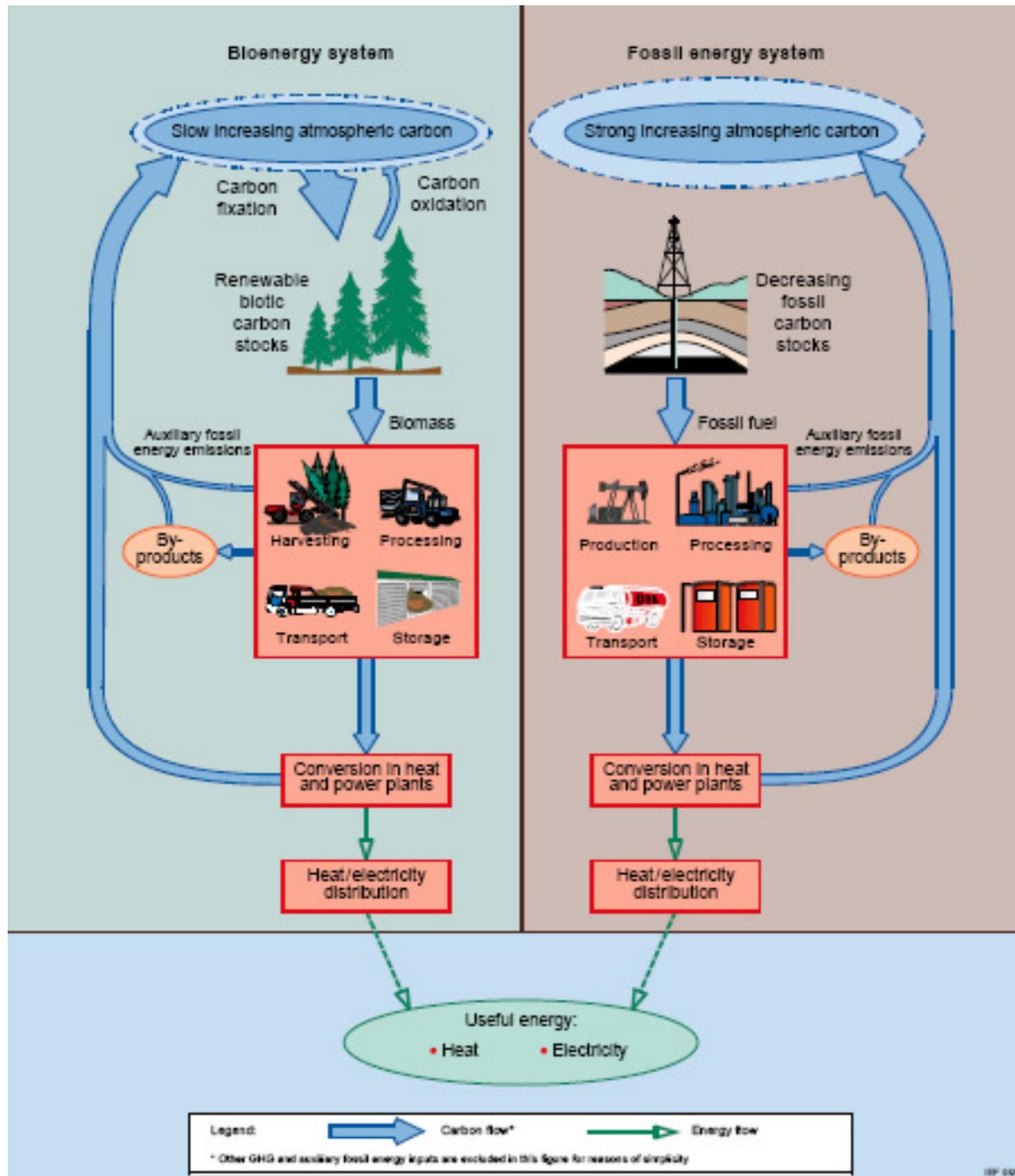


Growth in primary energy demand: China 3.2%, India 3.6%

# Energy related CO<sub>2</sub> emissions by region



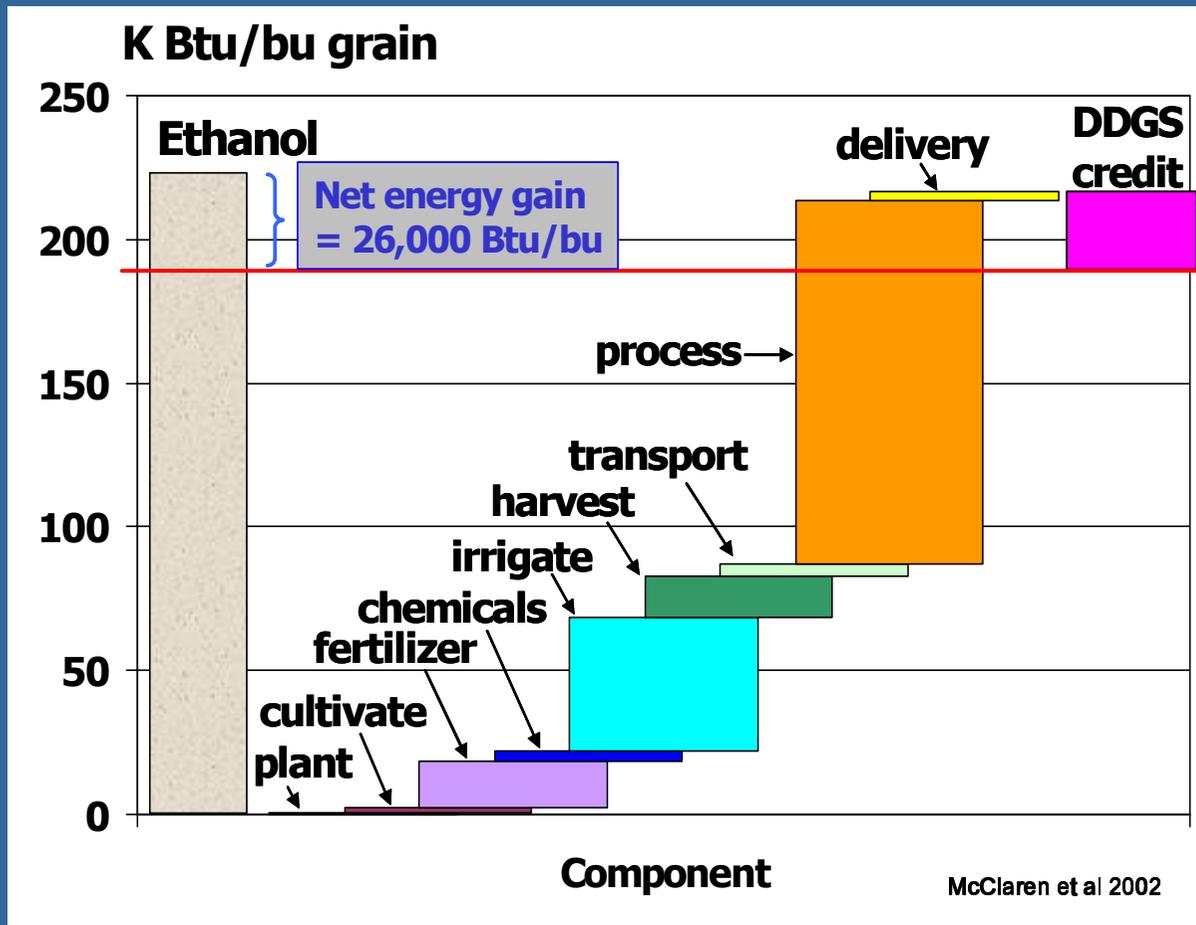
Source: Reference Scenario WEO, IEA 2007



## Life Cycle Analysis to estimate GHG balances

- Iso 14040 Life cycle assessment
- International Energy Agency (IEA) Bioenergy Task 38 - Greenhouse Gas Balances of Biomass and Bioenergy Systems
- Biomass-based climate change mitigation through renewable energy systems (Biomitre)

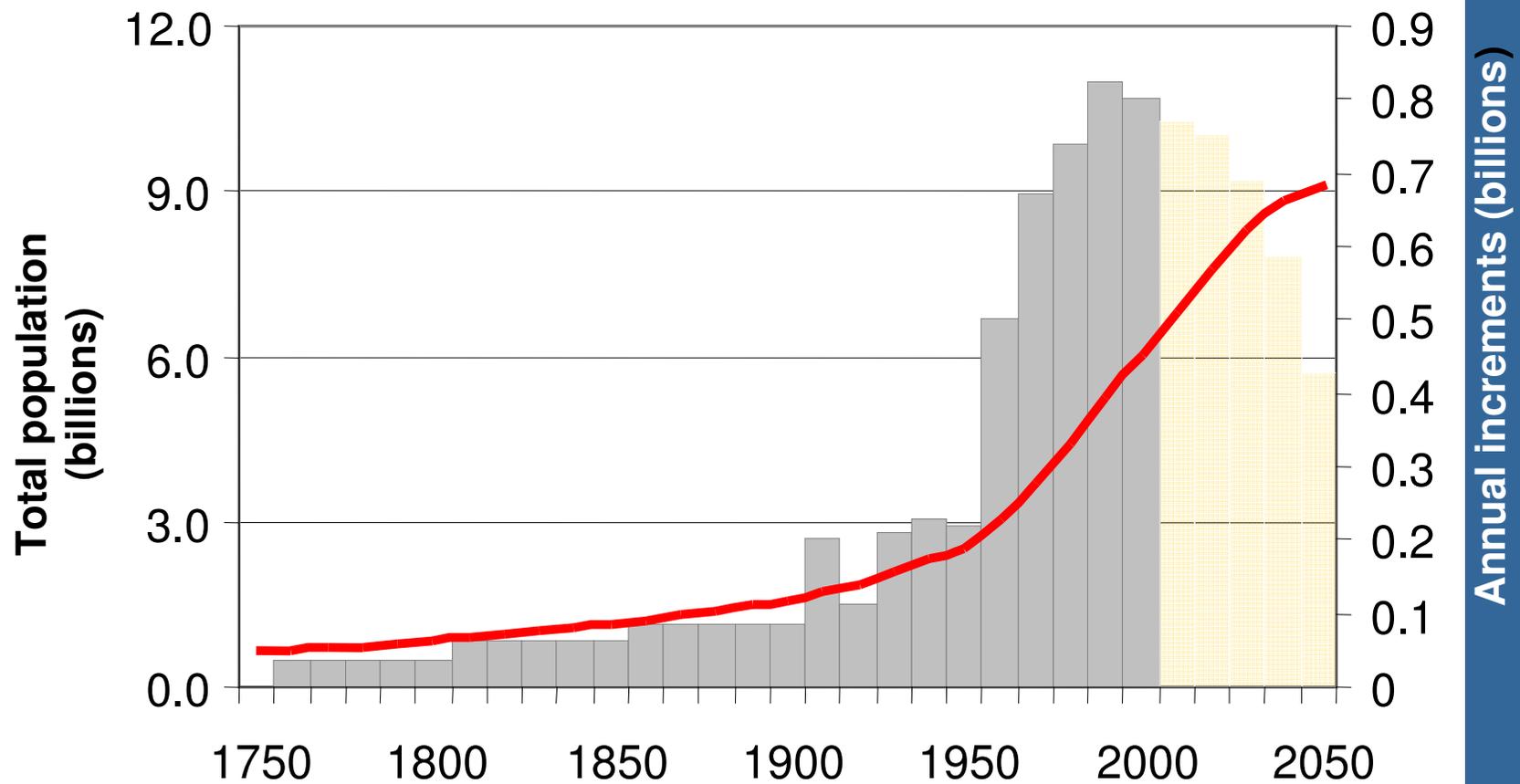
# Process chain: Sorghum life cycle inputs



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

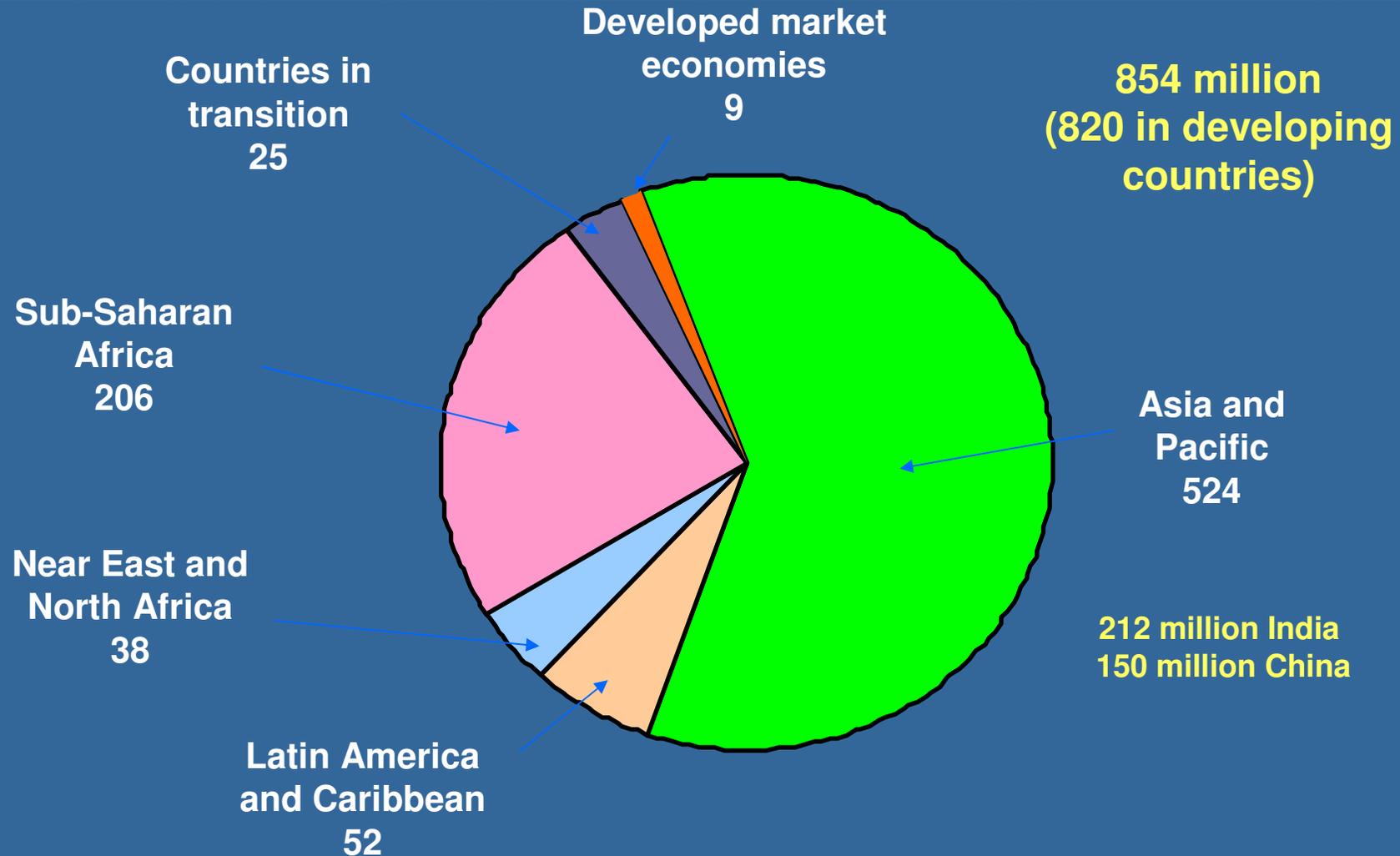
# Food Security

# World population: 1750 – 2050



Source: UN, 2003

# Undernourished

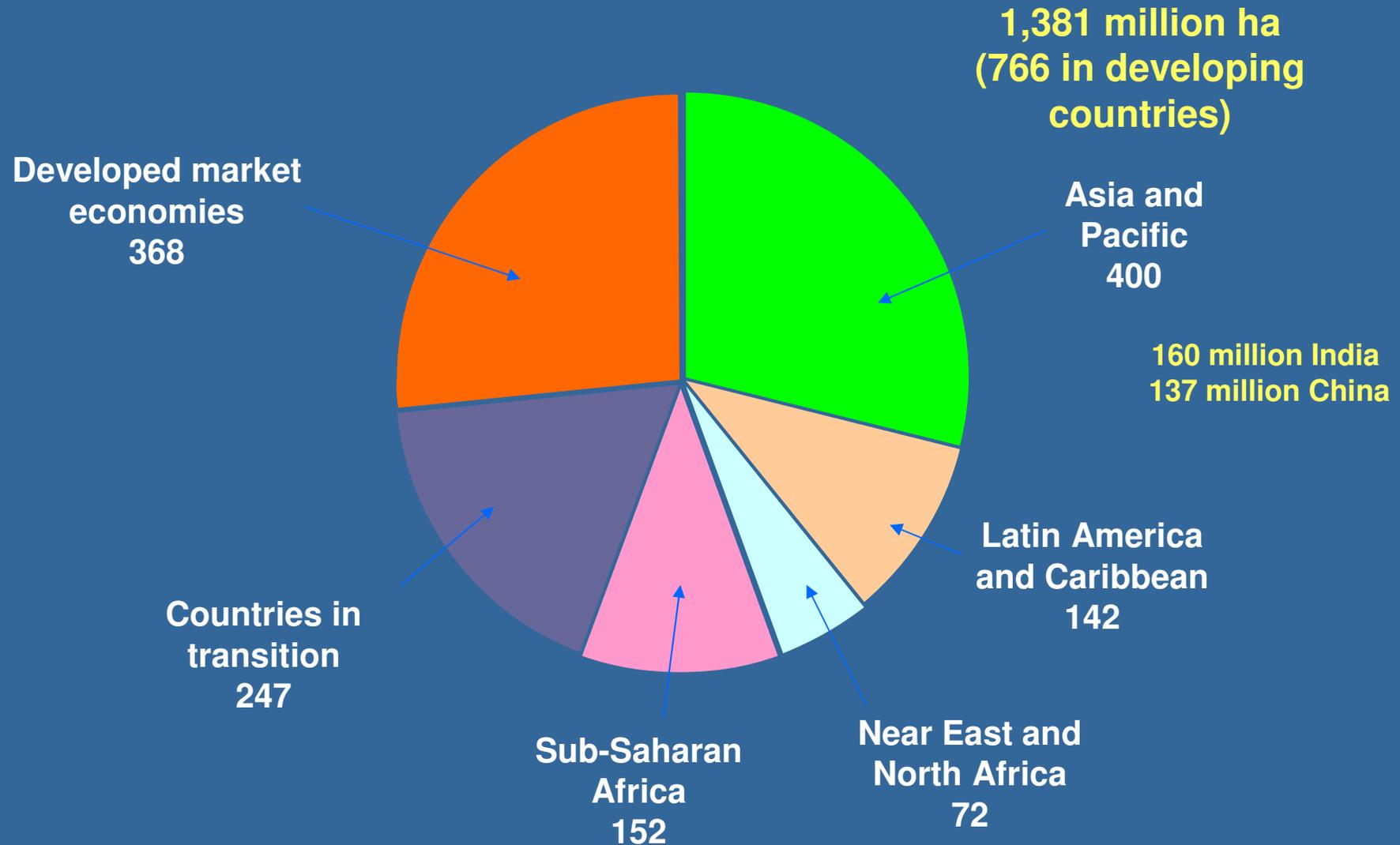


**854 million**  
(820 in developing countries)

**212 million India**  
**150 million China**

**Where is land available?**  
**Where is the energy deficit?**

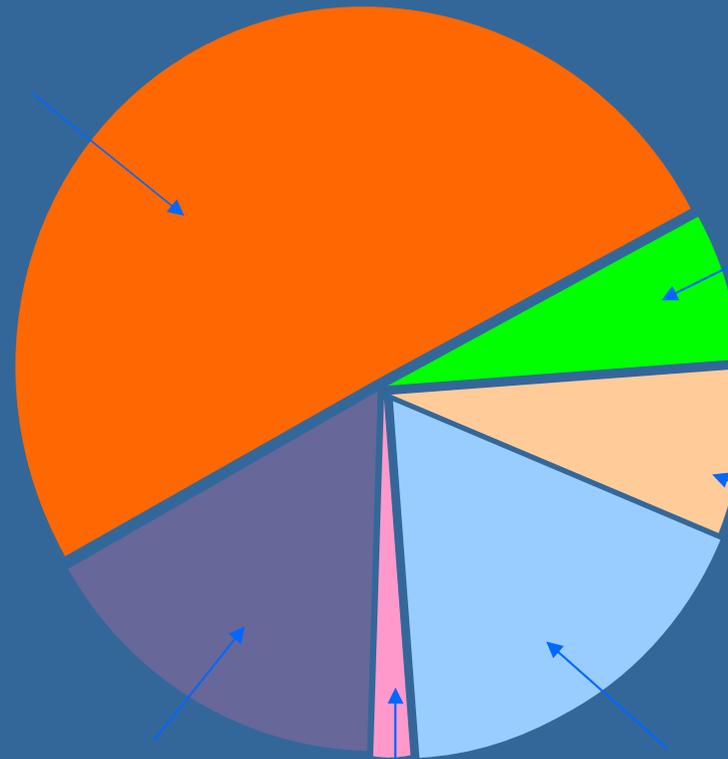
# Arable land



# Electricity consumption

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

Developed market  
economies  
9,864 kWh/capita



Asia and Pacific  
1,282 kWh/capita

457 kWh/capita in India  
1,585 kWh/capita in China

Latin America  
and Caribbean  
1,454 kWh/capita

Near East and  
North Africa  
3,438 kWh/capita

Countries in  
transition  
3,183 kWh/capita

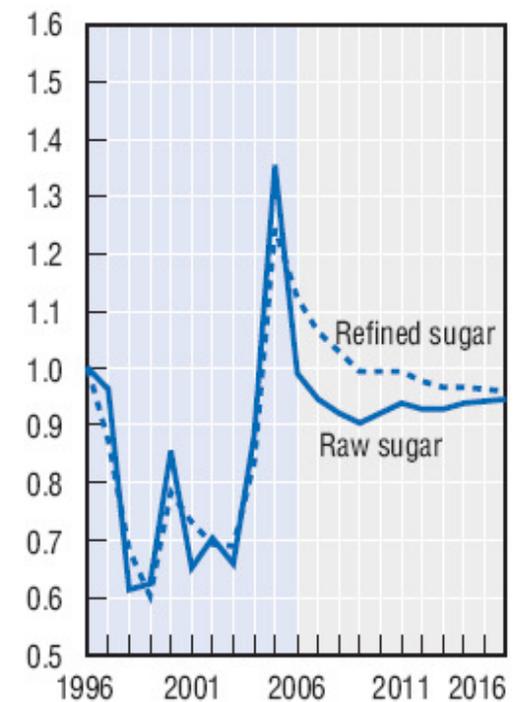
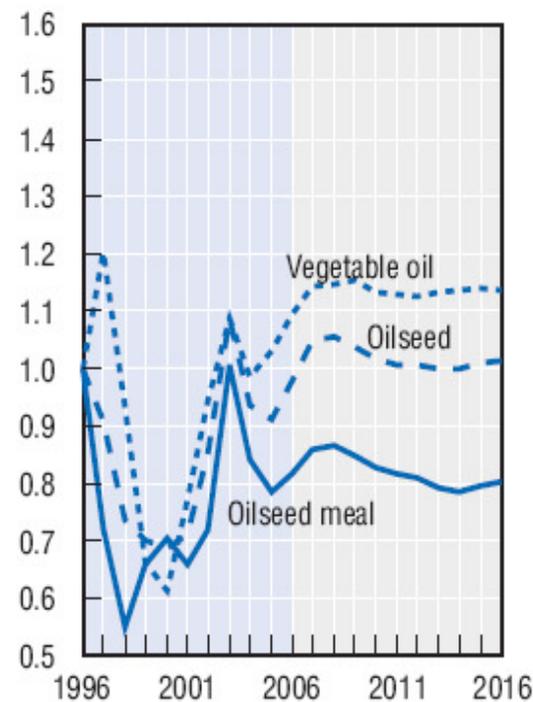
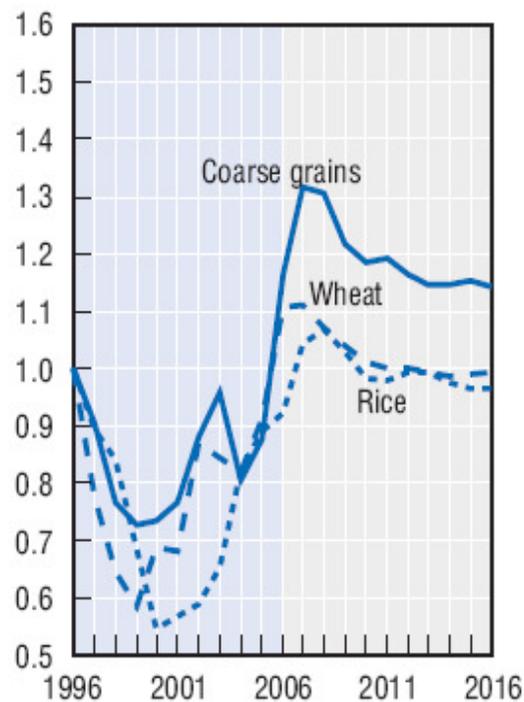
Sub-Saharan  
Africa\*  
347 kWh/capita

\* 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

# FAO role

- **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**

# GBEP REPORT: “A REVIEW OF THE CURRENT STATE OF BIOENERGY DEVELOPMENT IN G8 +5 COUNTRIES”

## 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.

# Key Messages

- 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**.