

Bioenergy development in the international context

The role of the Global Bioenergy Partnership

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Maria Michela Morese

Secretariat Manager

Global Bioenergy Partnership Secretariat

Food and Agriculture Organization of the United Nations



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**

A CONFLICT OF INTERESTS

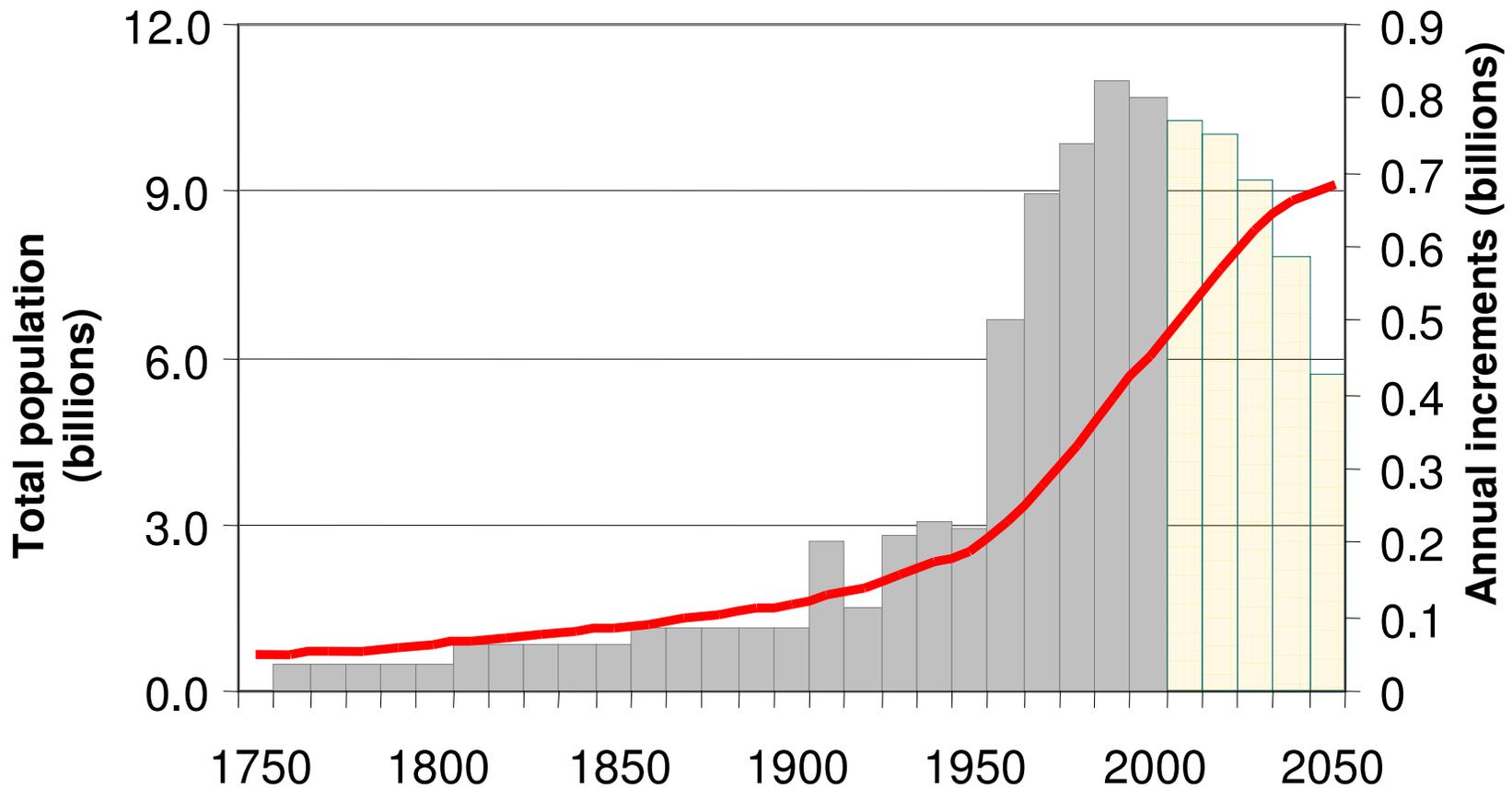
Energy security and Climate security

According to the **Intergovernmental Panel on Climate Change (IPCC)** a global emissions reduction by 30%-50% should be reached in the timeframe 2030-2050, to drive the stabilization of CO₂ concentration at a safe level (450-550 ppm) by the end of the century, to avoid irreversible changes in the climate system.

According to the Reference Scenario in the **IEA World Energy Outlook 2007**:

- World energy consumption will increase about 55% in the next 25 years, 84% from fossil fuels;
- The global CO₂ energy related emissions will increase of about 57%.

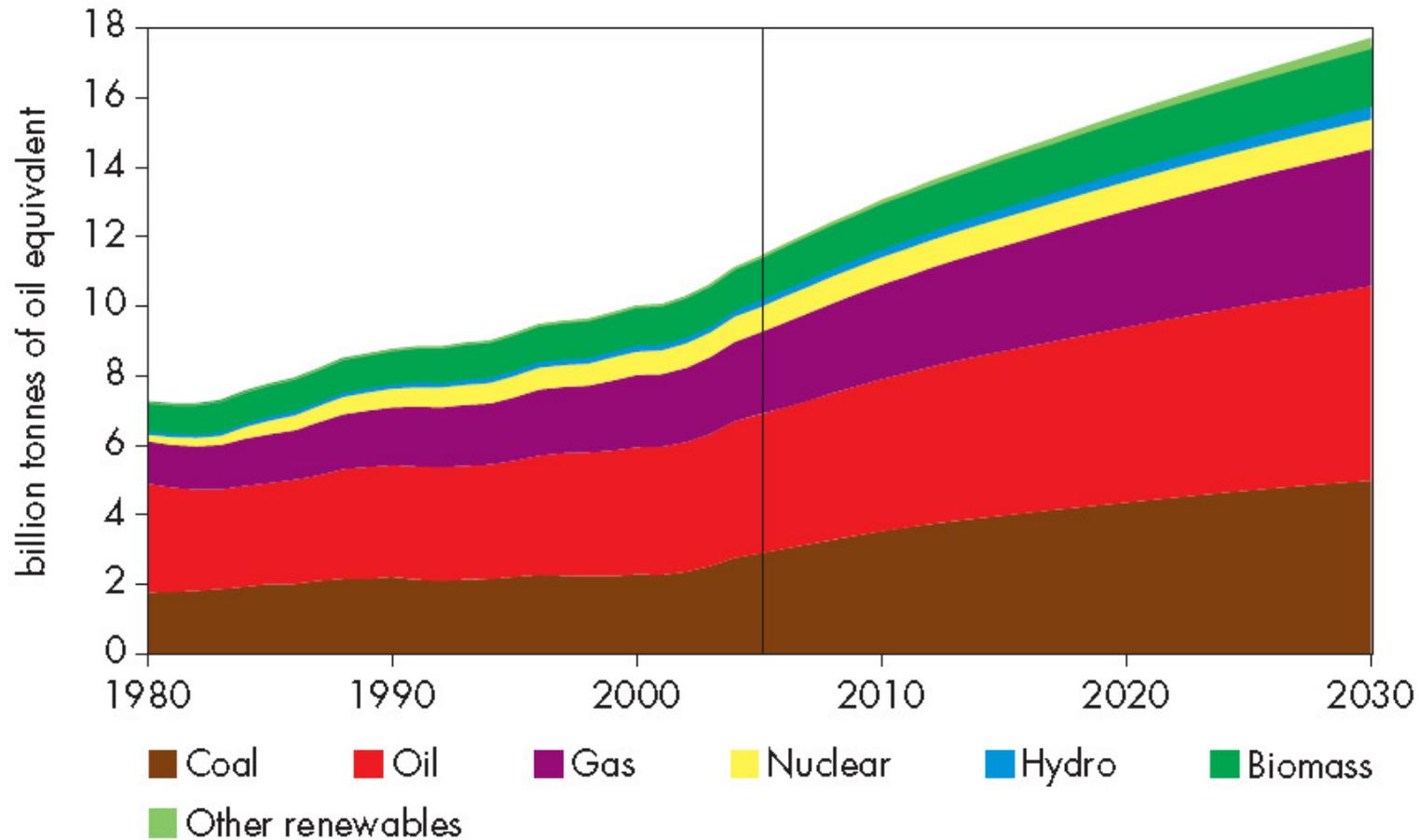
WORLD POPULATION: 1750 – 2050



Source: UN, 2003

WORLD PRIMARY ENERGY DEMAND

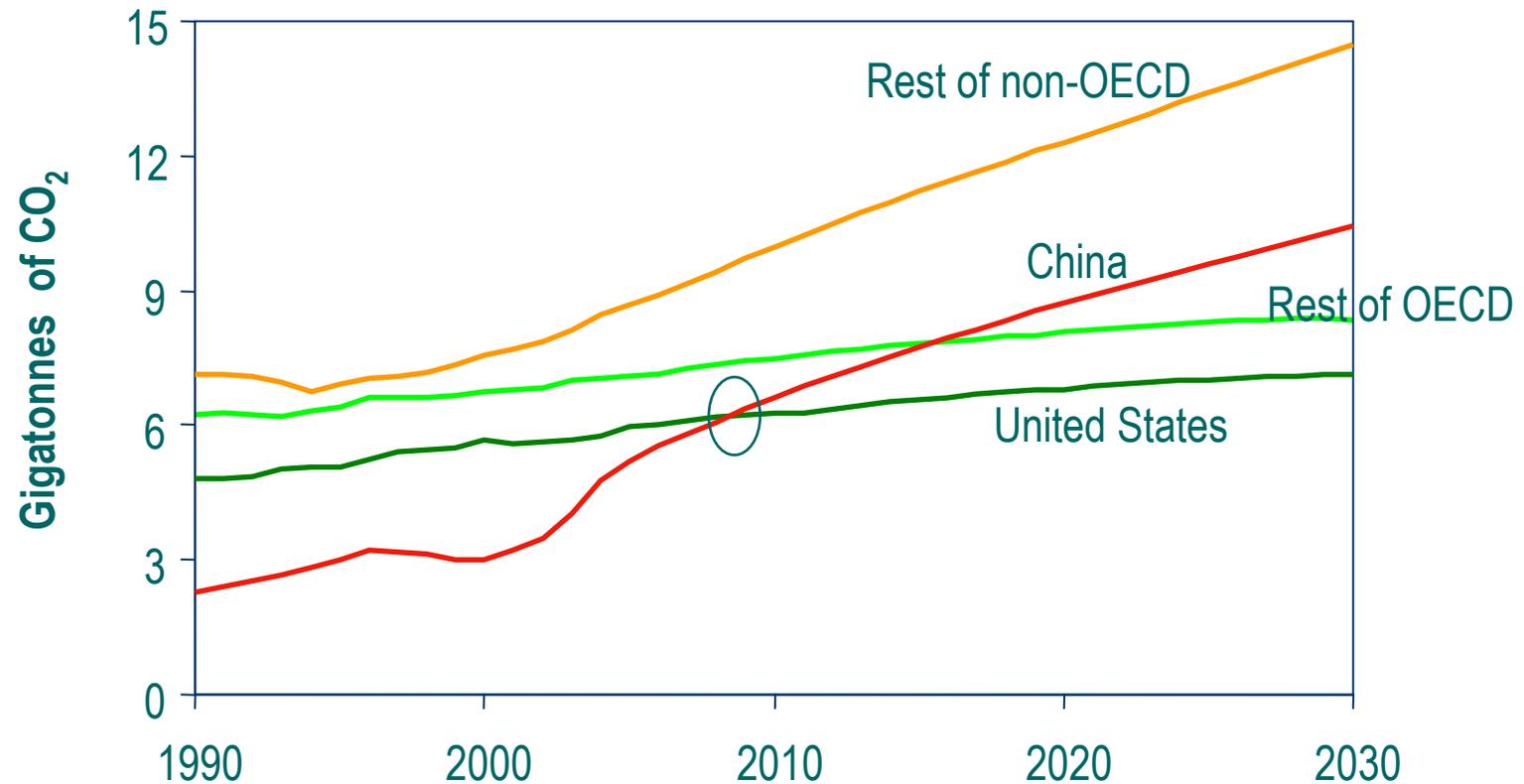
(Reference Scenario WEO 2007)



Source: Reference Scenario WEO, IEA 2007

ENERGY-RELATED CO₂ EMISSIONS

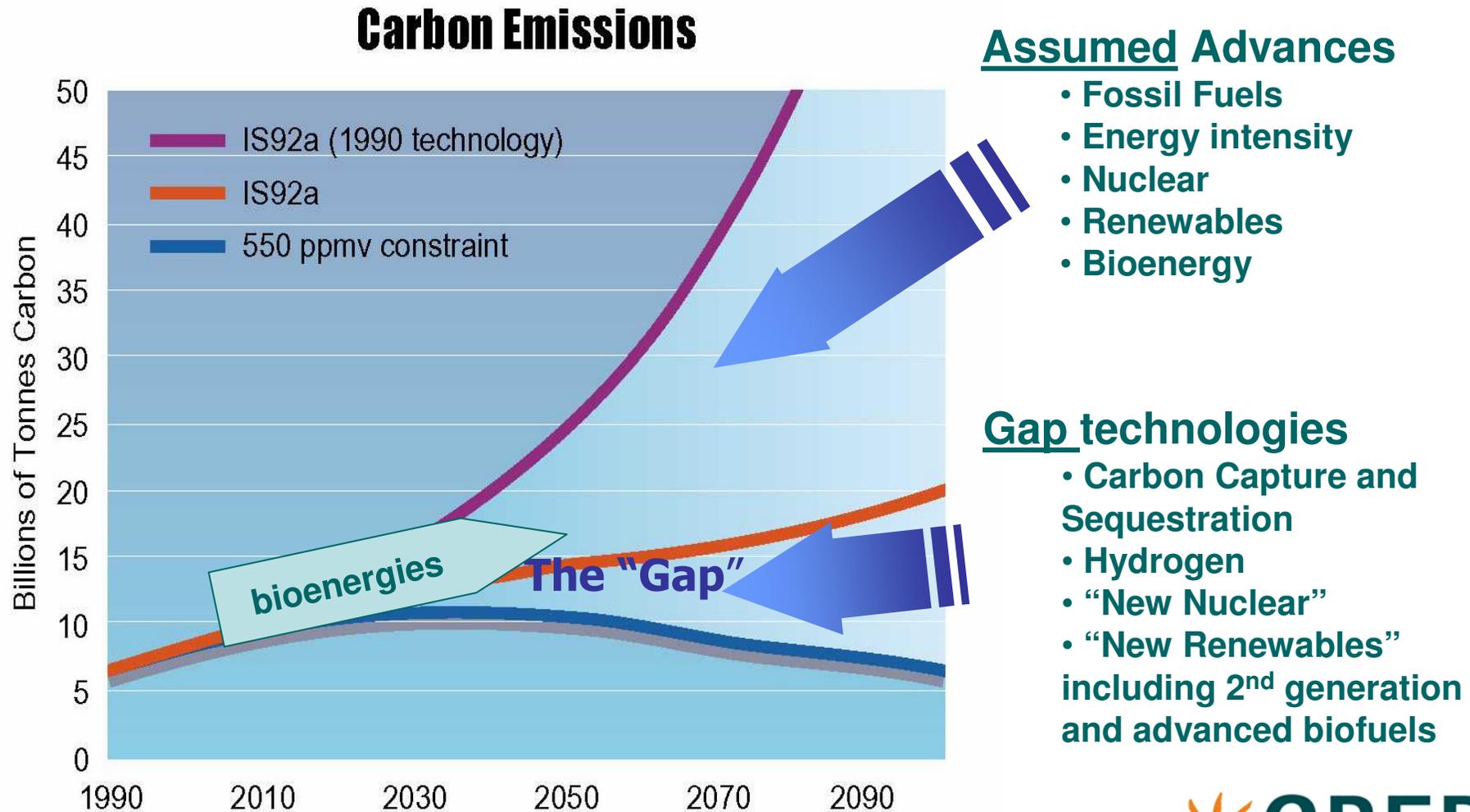
(Reference Scenario WEO 2006)



Source: Reference Scenario WEO, IEA 2006

STABILIZING CO₂

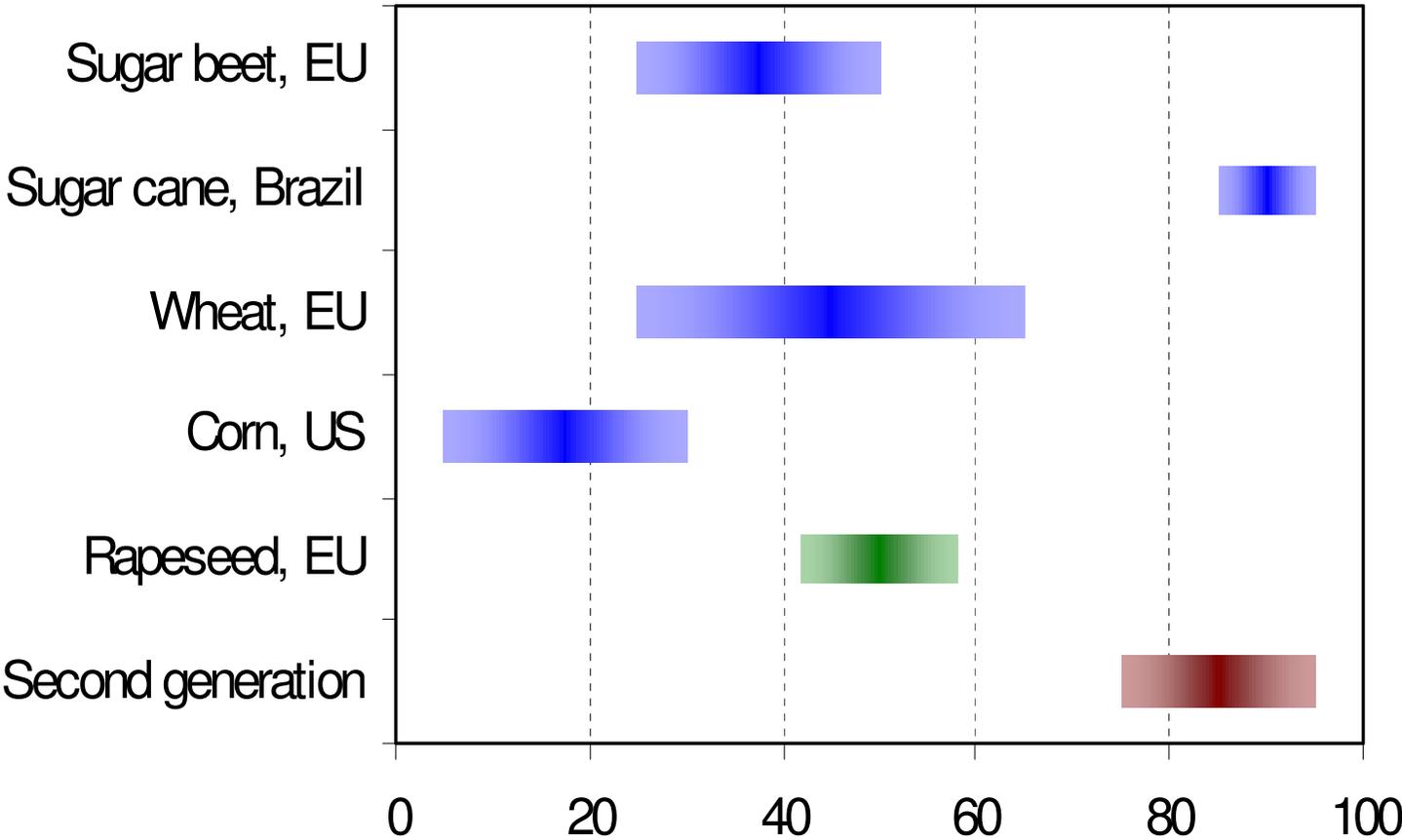
Base case and “Gap” technologies



Source: Jae Edmonds, PNNL/Univ MD

GHG ABATEMENT POTENTIAL FROM BIOFUELS

Well-to-wheel emission reductions



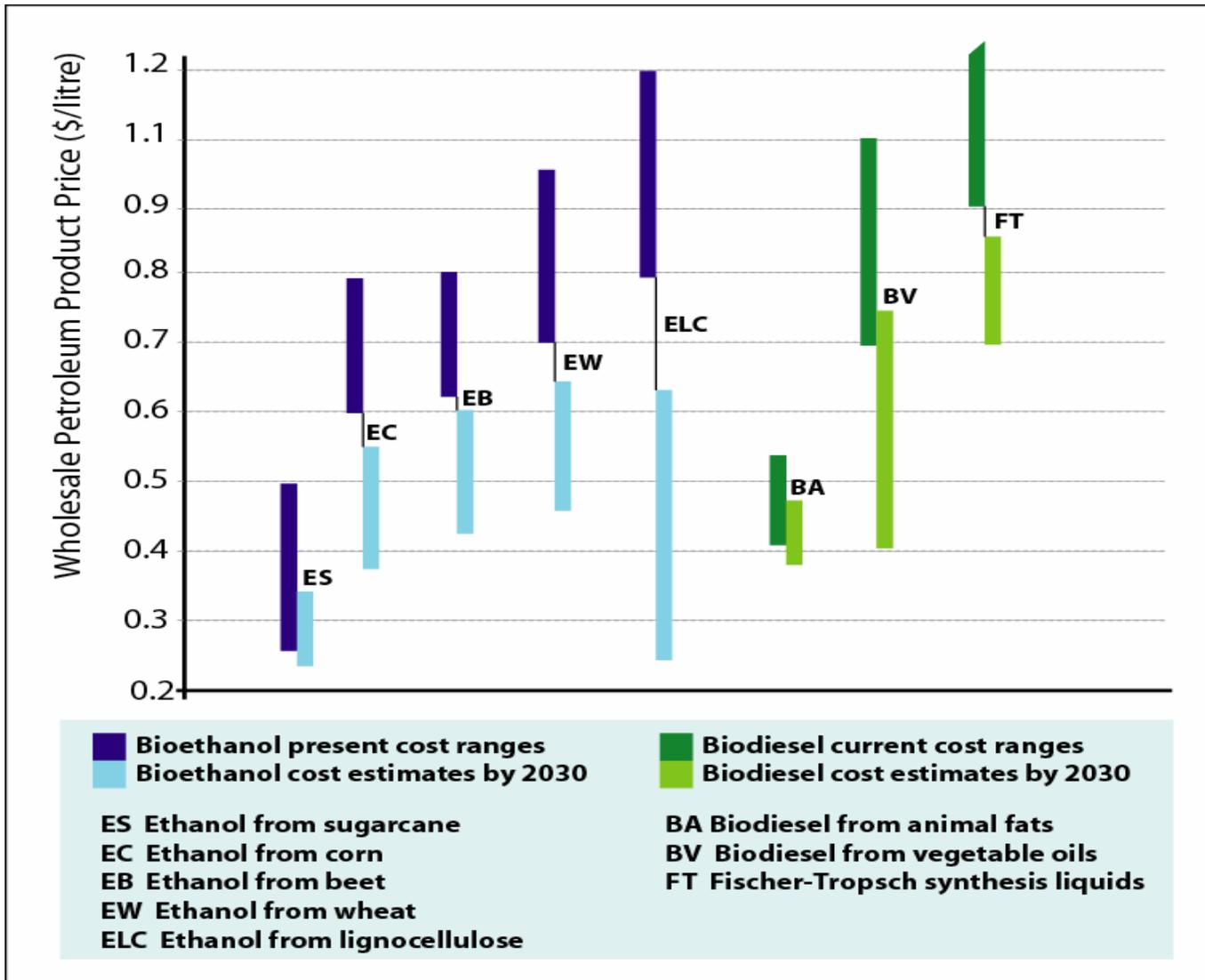
When made from corn, E85 reduces lifecycle GHG emissions (which include the energy required to grow and process corn into ethanol) by 15-20% as compared to gasoline. E85 made from cellulose can reduce emissions by around 70 percent as compared to gasoline. (US EPA 2007)

% reduction, compared to petroleum gasoline

Wide ranges are partly due to varying LCA assumptions and methodologies. IEA, 2007

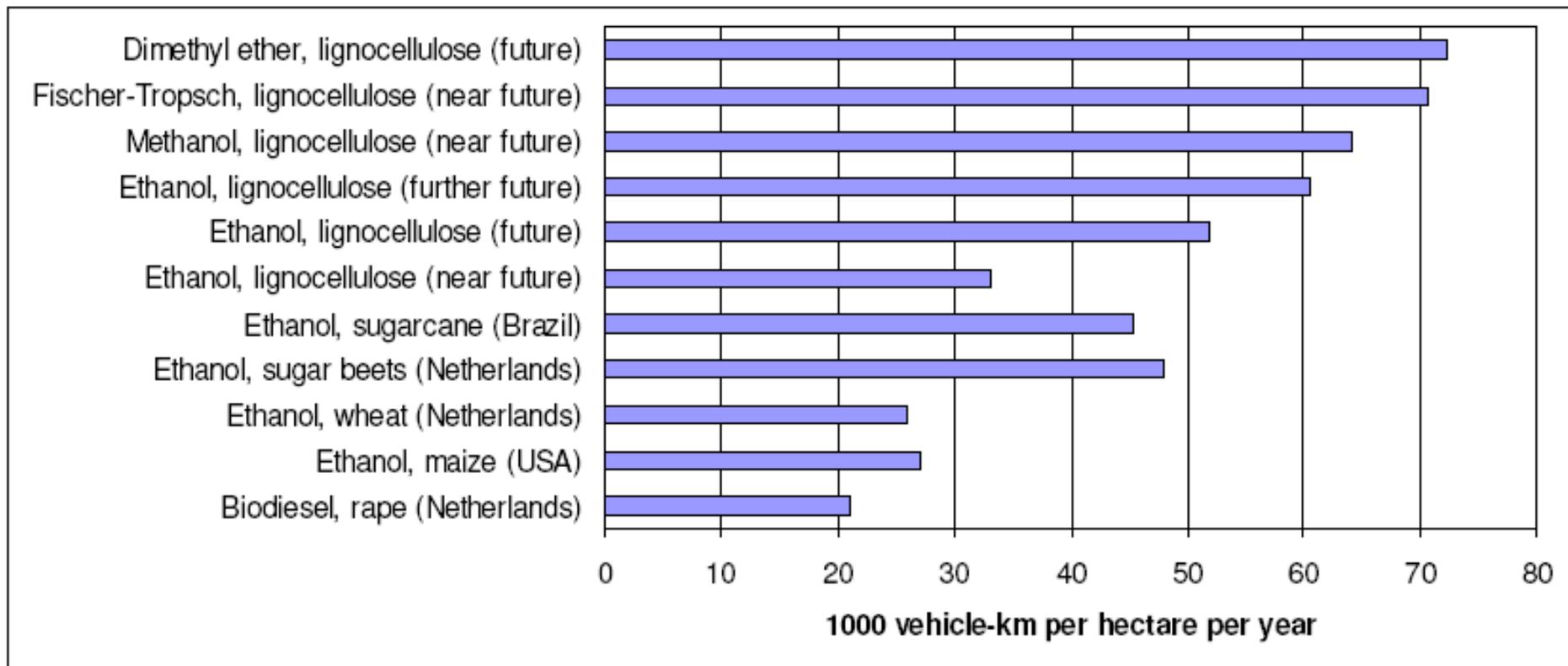


CURRENT AND FUTURE COSTS FOR BIOFUELS COMPARED WITH DIESEL AND GASOLINE



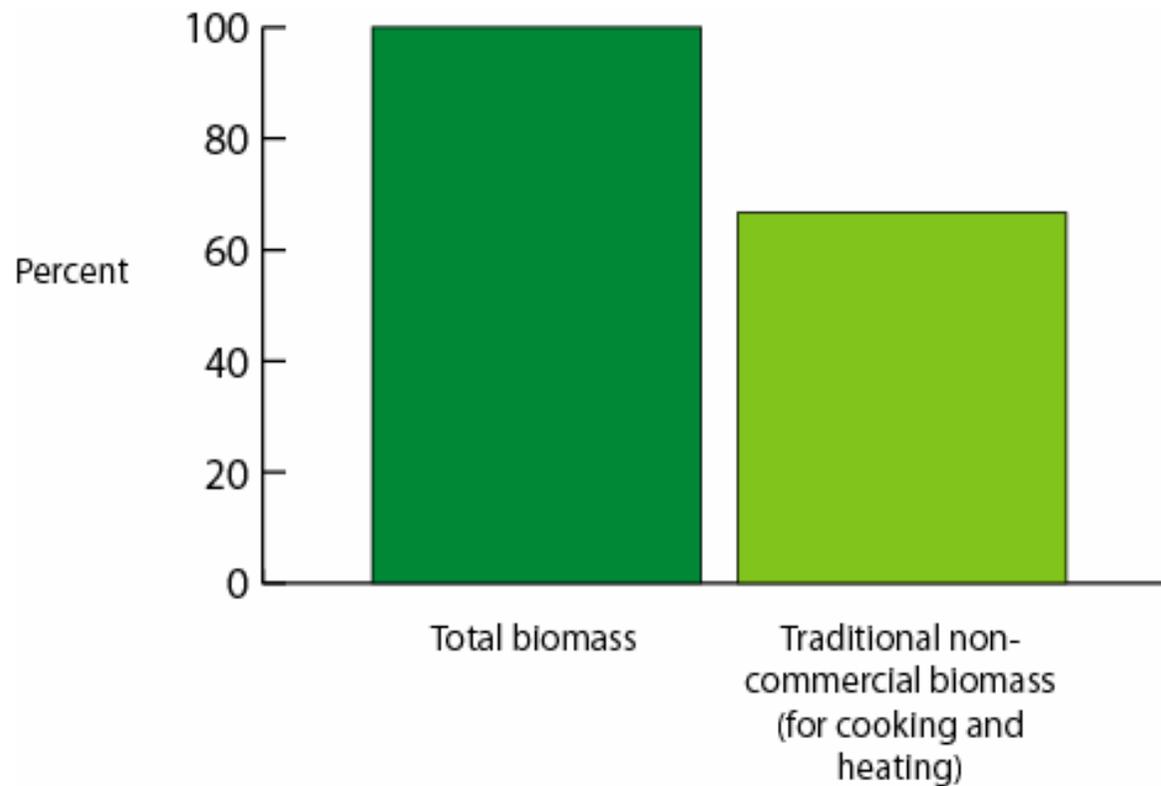
BIOFUELS Km/ha

Energy output per unit of land



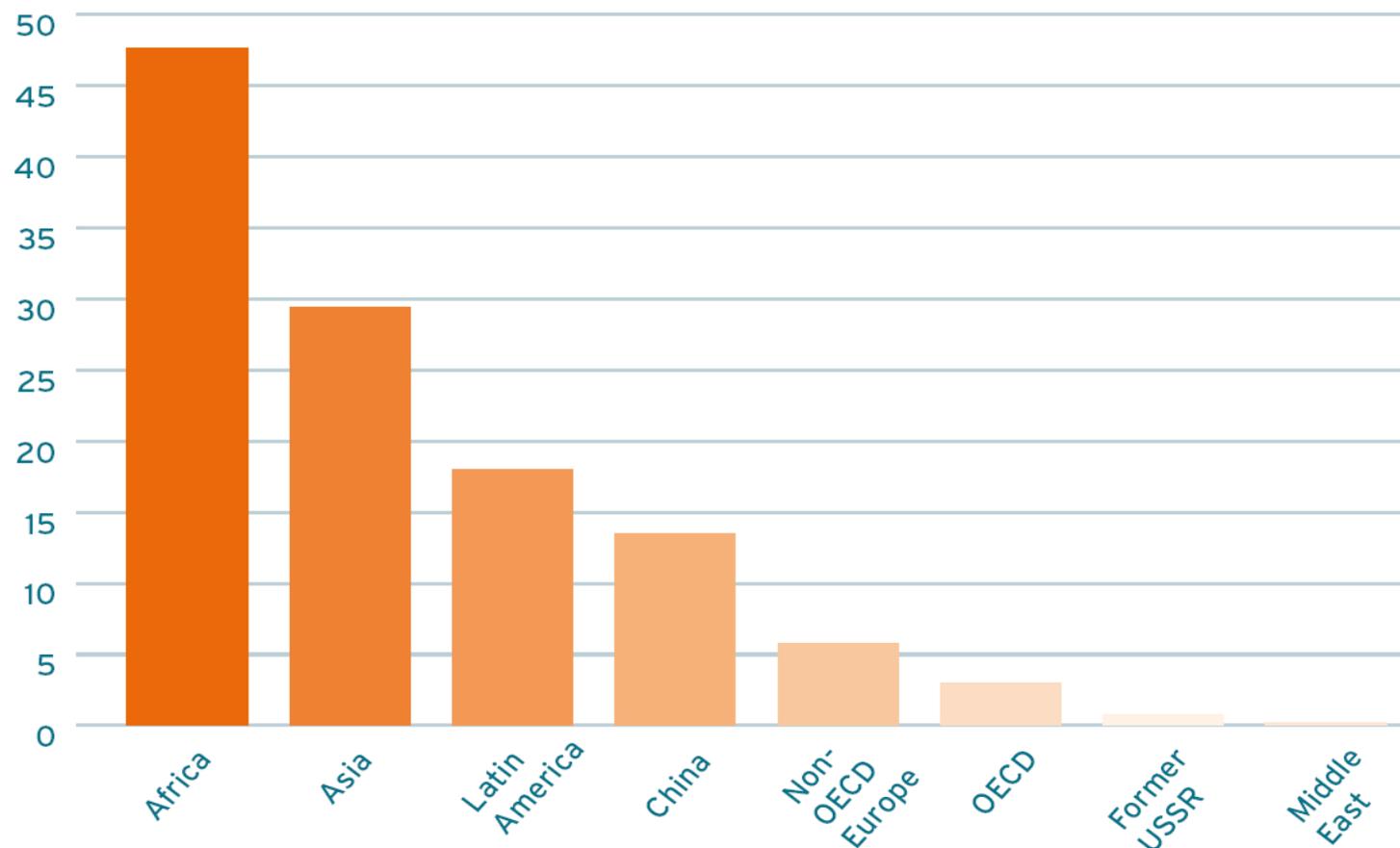
UNCTAD, 2007 - Estimates of vehicle-kilometers per year light-duty automobile travel per hectare for various first and second generation biofuels. Ethanol and methanol are used in spark-ignition engine vehicles (8.7 liters per 100 km fuel use). The other fuels are used in compression-ignition engine vehicles (6.2 liters per 100 km fuel use).

BIOMASS USE



Source: IEA ETP 2008

SHARE OF BIOENERGY IN GLOBAL ENERGY SUPPLY



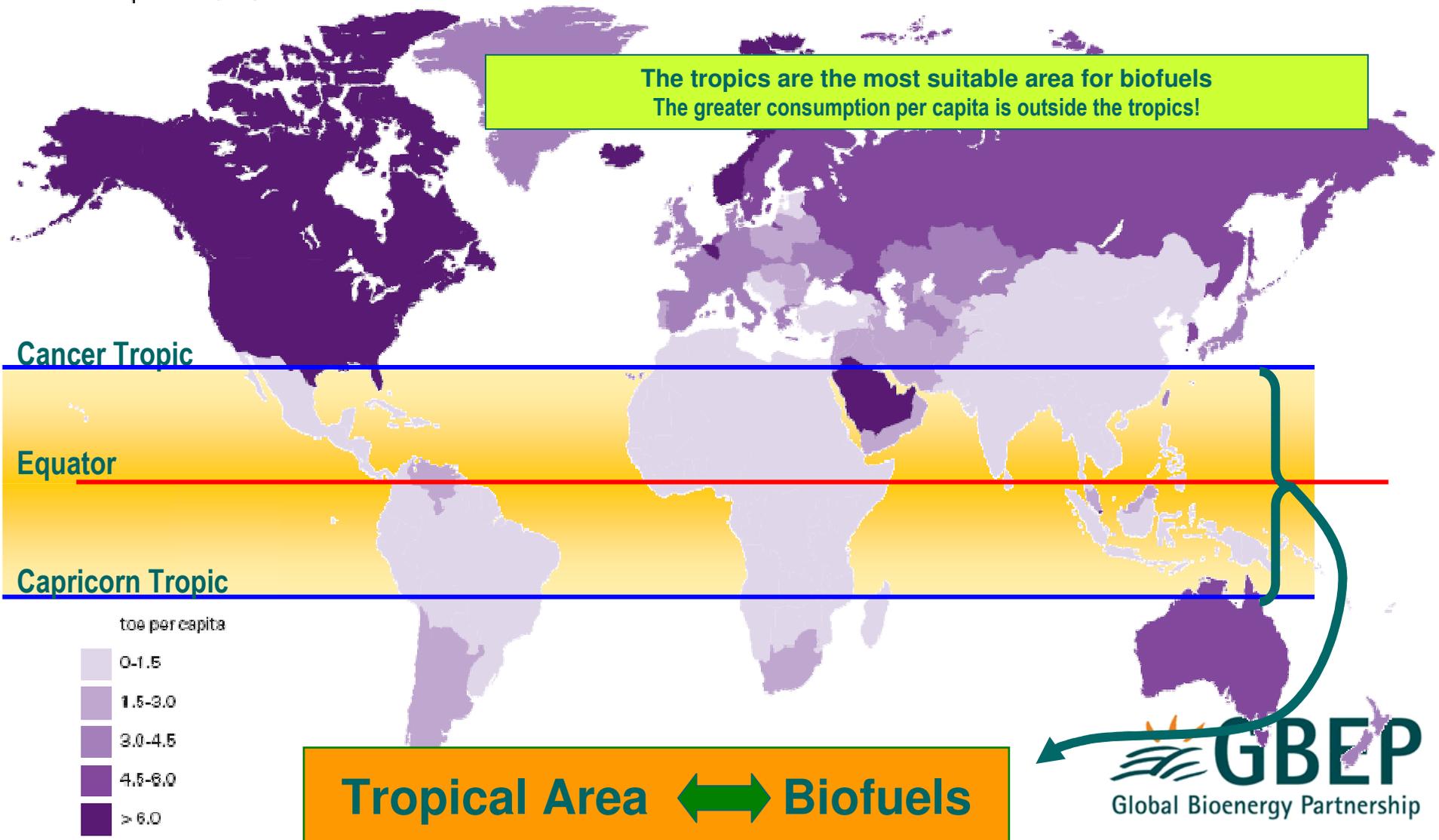
Share of bioenergy in total energy supply in several parts in the world in 2004 (in %).

Source: IEA 2006

ENERGY CONSUMPTION/BIOENERGY POTENTIAL

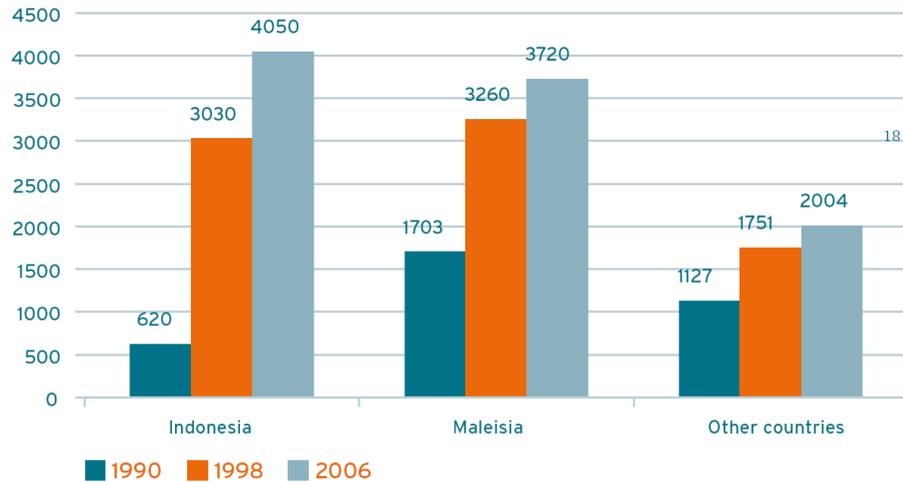
Consumption per capita
Tonnes oil equivalent (toe)

Source: BP Statistical Review (June/2006)



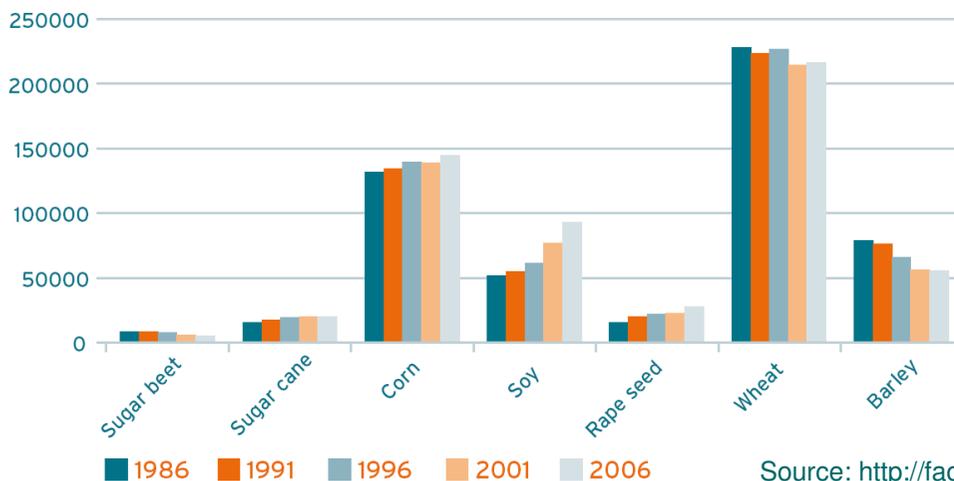
LAND USE

Land use palm oil, mature fruit-bearing trees (thousand hectares)



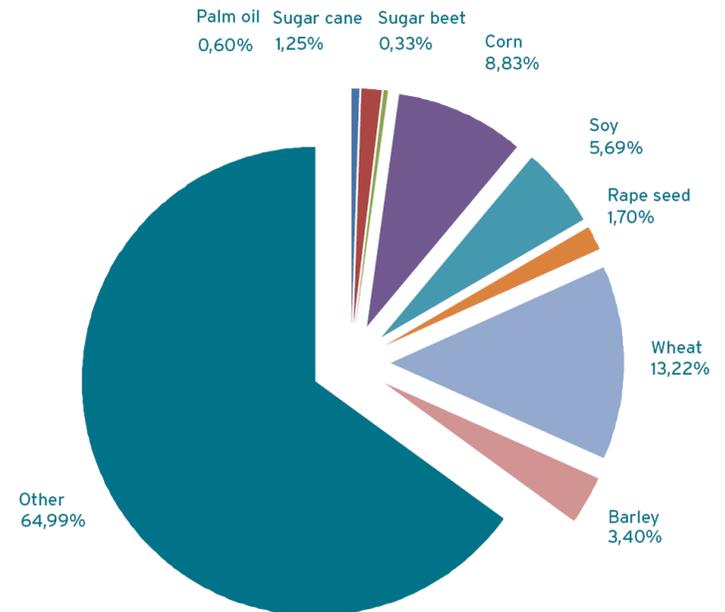
Source: Product Board MVO, <http://www.mvo.nl/duurzame-productie/download/071108%20MVO-FactsheetPalm%20NL.pdf>

Land use agricultural crops (thousand hectares)



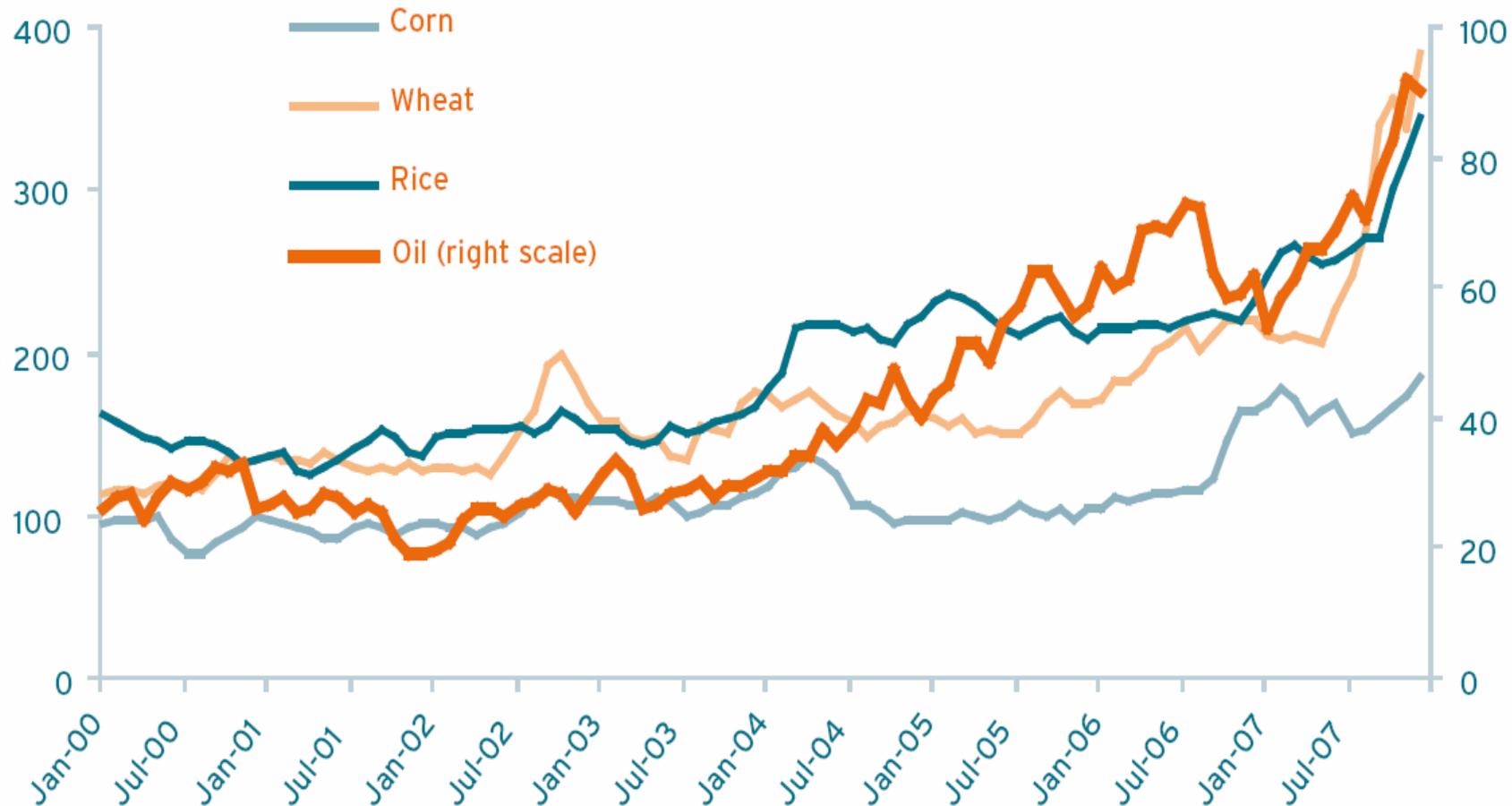
Source: <http://faostat.fao.org/site/339/default.aspx>, april 2008

Land use in the world (%) in 2006



Sources: <http://faostat.fao.org/site/339/default.aspx> and Product Board MVO. The total land use in 2006 is estimated from Dornburg et al., 2008 (p. 49 in the 'Main Report'). In 1999 1.608 million hectares are used for agriculture. For 2015 a total agricultural area of 1.669 million hectares is estimated. For 2006 (this figure) an estimate of 1.635 million hectares is made.

Surge in cereal and oil prices (US\$/ton)



Oil prices effect prices for agricultural products, even if they are not used for bioenergy (e.g. rice)

Source: Presentation International Food Policy Research Institute (IFPRI), Joachim von Braun, february 2008 (data van FAO 2007 en IMF 2007), <http://www.ifad.org/events/lectures/ifpri/presentation.ppt#4>

Biofuels only one driver of high food prices

- economic growth and changes in diet
- declining investment in agriculture
- declining cereal stocks and reserves
- weather-related production shortfalls/extreme weather events
- cost of oil
- exchange rates and trade restrictions

BIOFUELS: TOWARDS A SUSTAINABLE OPTION

- > Biofuels can help reducing emissions and addressing energy security if produced in appropriate way.
- > Labeling and certification should be used to ensure sustainable development, environmental gains and promote social equity.
- > However, sustainability criteria should not represent a way for the introduction of un-necessary trade barriers and protectionism against developing countries export opportunities.

G8 Commitments and Mandates

2005 Gleneagles Plan of Action:

*“We (the G8) will promote the continued development and commercialisation of renewable energy by: [...] d) launching a **Global Bioenergy Partnership** to support wider, cost effective, biomass and biofuels deployment, particularly in developing countries where biomass use is prevalent, following the Rome International Workshop on Bioenergy”.*

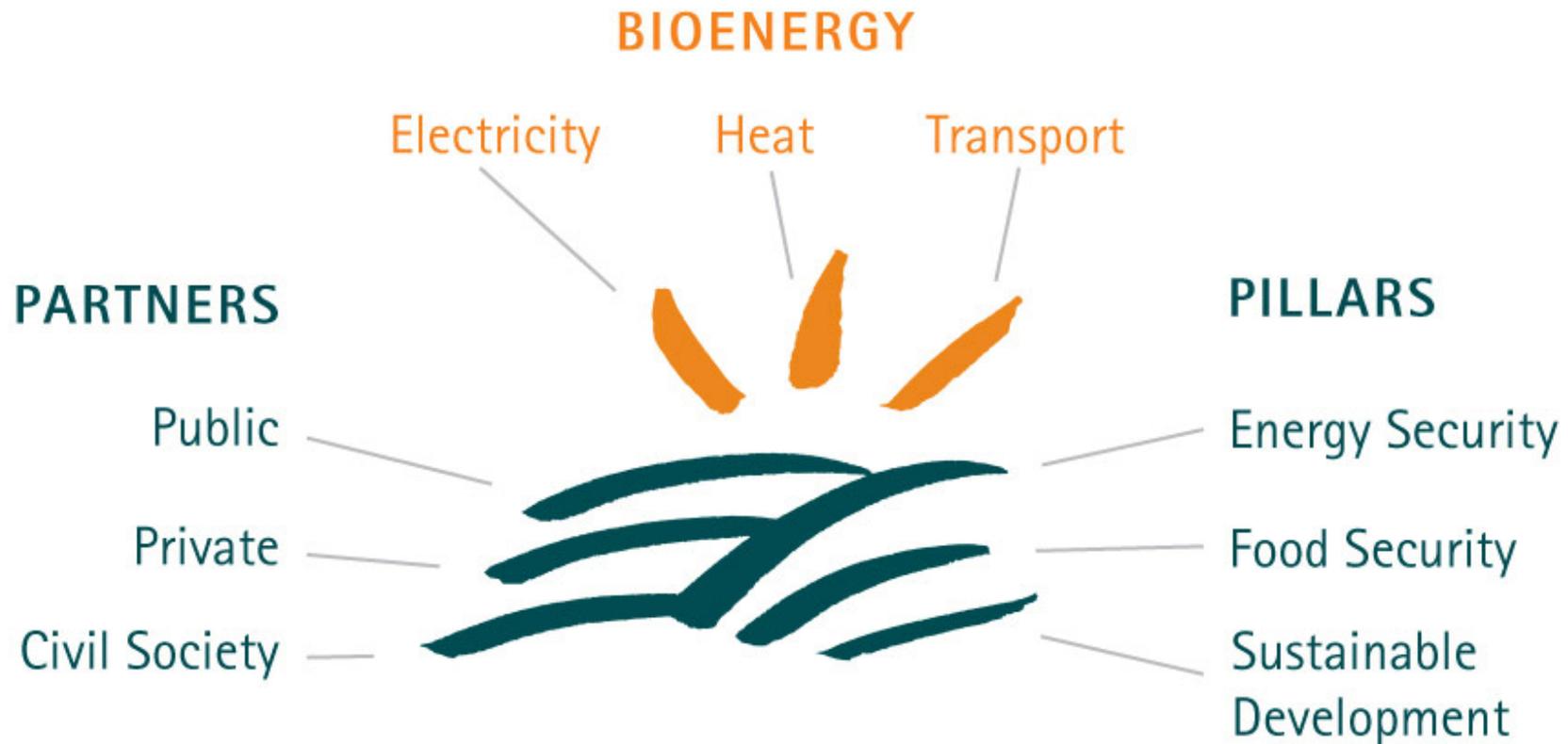
2007 Heiligendamm Summit Declaration:

*“We invite the **Global Bioenergy Partnership (GBEP)** to continue its work on biofuel best practices and **take forward the successful and sustainable development of bioenergy**”*

2008 Hokkaido Toyako Summit:

*“We support the work of the **Global Bioenergy Partnership (GBEP)** and invite it to work with other relevant stakeholders to **develop science-based benchmarks and indicators for biofuels production and use**”*

GBEP – Scope, Partners, Pillars



GBEP Programme of Work

- Facilitate the **sustainable development of bioenergy** and collaborate activities in the bioenergy field projects.
- **Formulate a harmonized methodological framework** on GHG emission reduction measurement from the use of biofuels for transportation and from the use of solid biomass
- **Raise awareness and facilitate information exchange on bioenergy**

GBEP Programme of Work

SUSTAINABLE DEVELOPMENT OF BIOENERGY

“GBEP Task Force on Sustainability” (UK leading Partner)

Actions and Objectives:

- Develop an inventory of what is being done on bioenergy sustainability internationally;
- Identify and discuss commonalities, differences and issues requiring further consideration;
- Facilitate the sharing of information, data, experiences and best practices relating to sustainable bioenergy production and use;
- Develop a set of **global science-based criteria and indicators** regarding the sustainability of bioenergy.

This work, expected to be finalized by APRIL 2009, will provide a reference for all interested stakeholders and in the formulation of national policies and international cooperation programmes.

GBEP Programme of Work

HARMONIZED METHODOLOGICAL FRAMEWORK ON GHG EMISSION REDUCTIONS

GBEP Task Force on GHG emission reductions (US leading Partner)

Activities and Objectives:

- Review existing methodologies and analyse the full well-to-wheel lifecycle of transport biofuels and solid biomass;
- Develop a harmonized methodological framework so GHG lifecycle assessments can be compared on an equivalent basis.

4 Sub-groups:

- Sub-group 1 - Land use change and feedstock production (**US** leading);
- Sub-group 2 – Biomass processing (**EC** leading);
- Sub-group 3 – Fuel transportation and use (**Germany** leading);
- Sub-group 4 – Biofuel usage compared to fossil fuel (**Brazil** leading).

This work, expected to be finalized by MARCH 2009, will provide a reference for the use of policy makers and stakeholders when assessing GHG impacts so that GHG lifecycle assessments can be compared on an equivalent basis.

GBEP Programme of Work

RAISE AWARENESS AND INFORMATION EXCHANGE

This GBEP activity seeks to increase the understanding of pertinent issues related to bioenergy development among Partners and between the Partnership, other technical and political actors, and the general public.

Activities:

- **First GBEP Report** - “A Review of the Current State of Bioenergy Development in G8 +5 Countries” (released on November 2007)
- development of **GBEP information material** and a GBEP website (www.globalbioenergy.org);
- participation in relevant **international conferences** and meetings focused on bioenergy, and organization of specific GBEP events;
- organization of an **international media campaign** to promote GBEP activities.

For further information

GBEP Secretariat

Food and Agriculture Organization of the UN

Rome - ITALY

E-mail: GBEP-Secretariat@fao.org

www.globalbioenergy.org