

Global Bioenergy Partnership

*Working together to promote bioenergy
for sustainable development*

**Punti di forza e di debolezza dell'energia da biomasse
Dibattito e proposte concrete**

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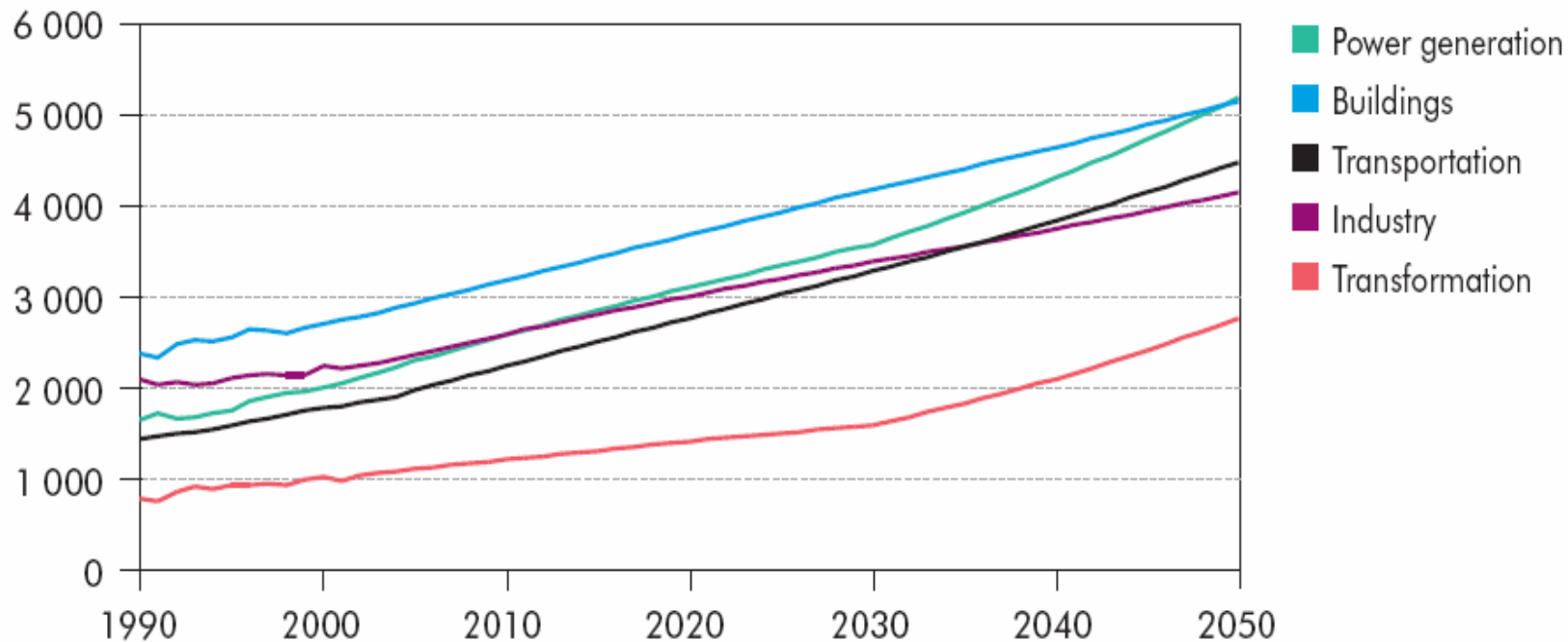


KEY POINTS

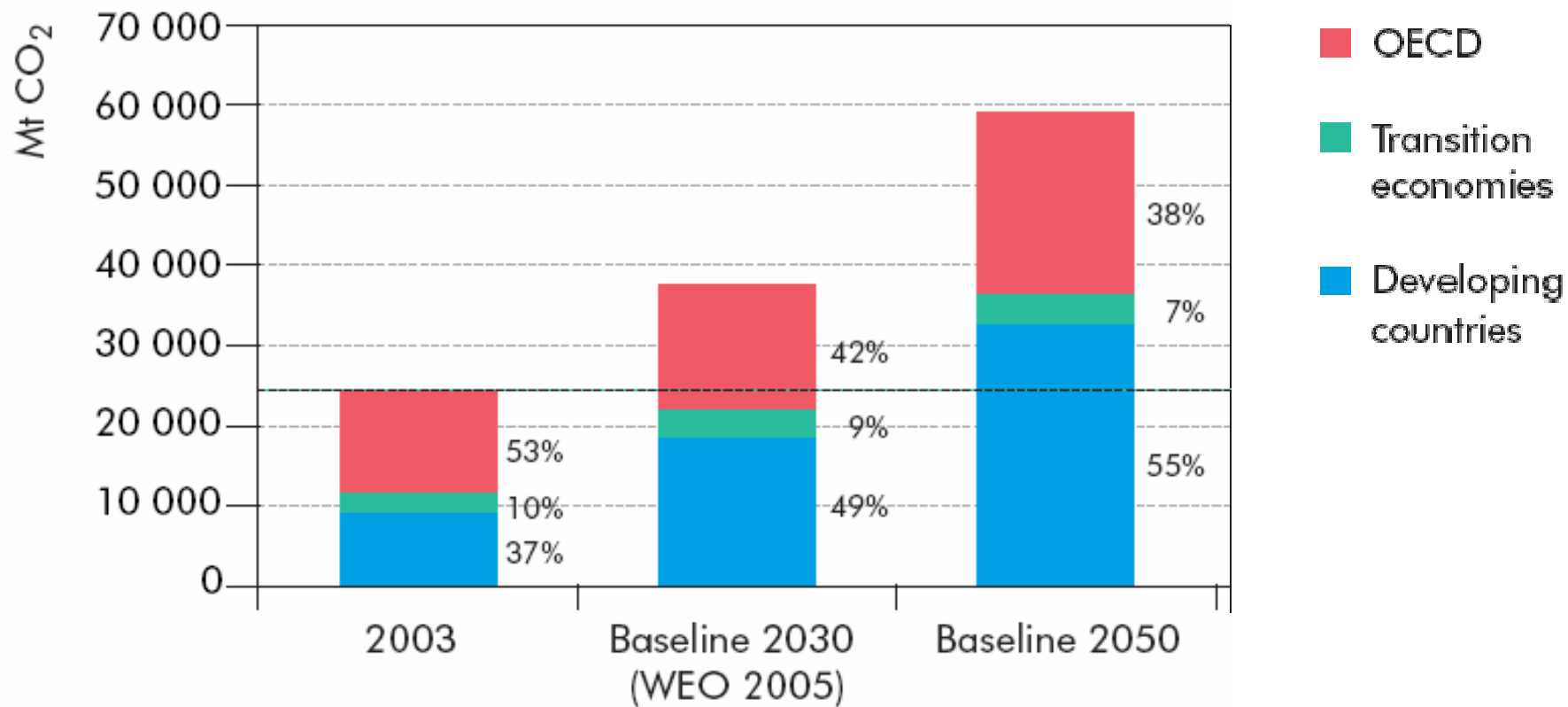
- 1. Energy and Climate Change**
- 2. International Partnerships for GHG mitigation**
- 3. GBEP update**
 - **Biofuels in G8 +5 countries today**
 - **Biofuels development and perspectives**
 - **CO2 balance**
 - **Sustainability criteria**
 - **Economics**
 - **Projects**

Key messages

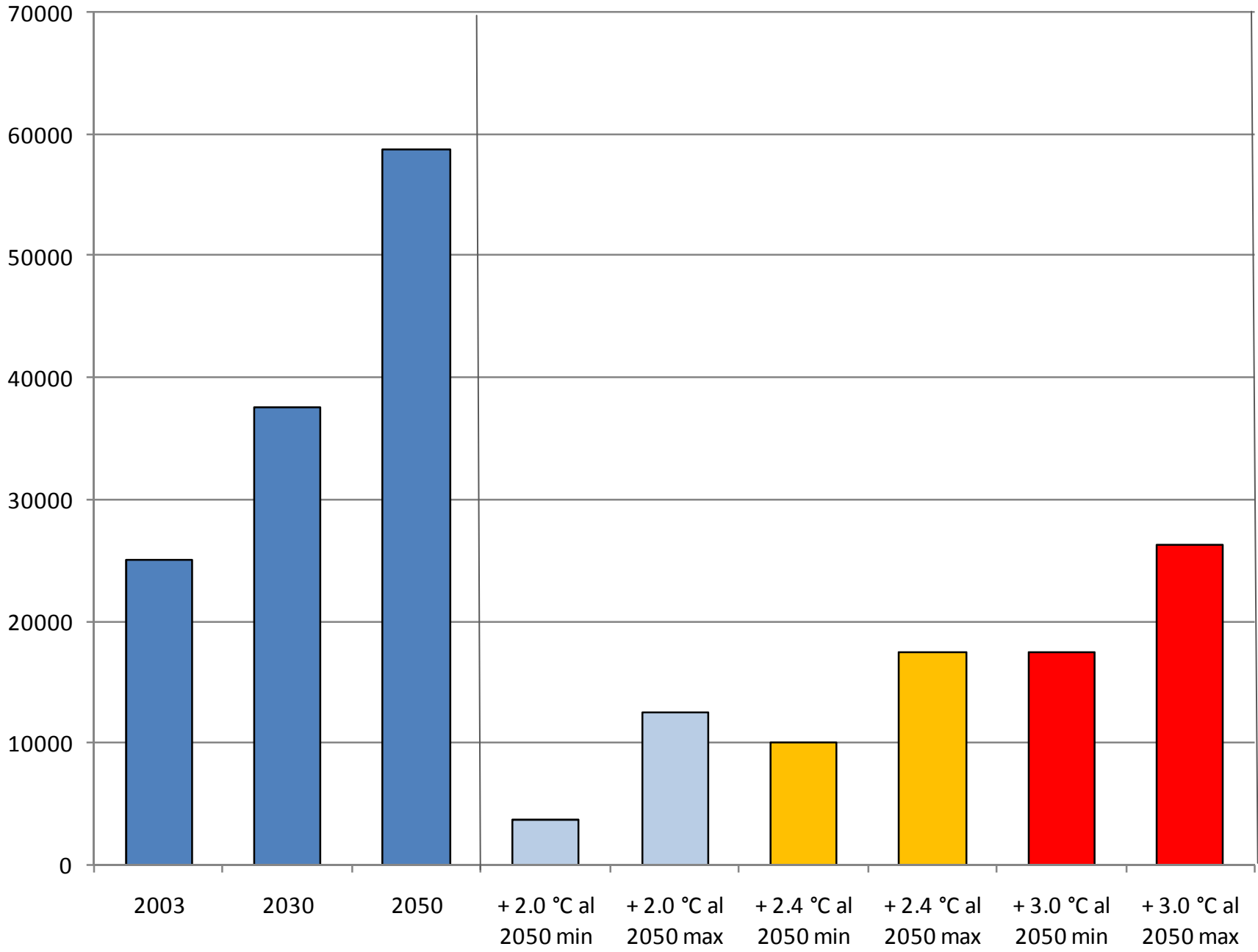
Energy use by sector in the Baseline Scenario



	Baseline Scenario	
	2003 (Mtoe)	2050 (Mtoe)
Electricity and heat plants	2 180	5 177
Other fuel transformation	1 003	2 761
Industry	2 326	4 138
Transport	1 895	4 472
Buildings and appliances	2 733	5 142



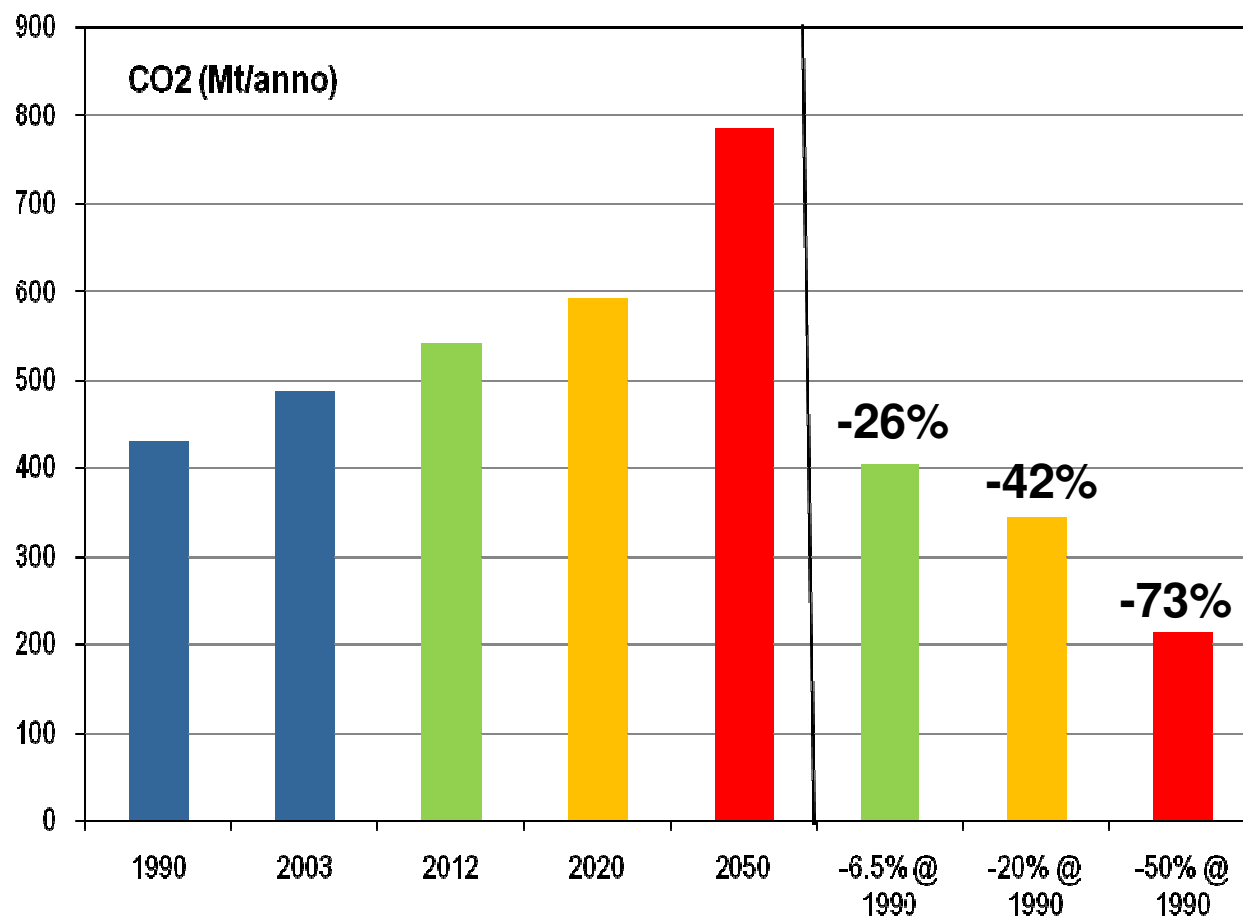
CO2 (Mt/year)



CO2 EMISSION TO BE AVOIDED in 2050

Order of magnitude 30 giga ton/year

ITALIA



Emissioni al 2050 estrapolate dal periodo 1997-2007 (BaU)

ITALIA (stima preliminare) 2050

- Emissioni previste (BaU) 780 Mton
- Emissioni permesse (IPCC) 220 Mton

- GAP 0.56 giga ton CO₂

WHAT'S A GIGATON OF CO2 ?

Coal fired plant	273 zero emission 500 MW
CCS	1000 sequestration sites like Sleipner (only 3 in operation today)
Nuclear	135 nuclear sites 1GW
Efficiency	Deploy 273 million new car at 40 mpg instead of 20 mpg
Wind	4 times the current global gen capacity of 74 GW
Solar PV	273 times the current global solar PV
Biofuels	Convert a barren area of about 4800.000 km2 (2 times UK)
CO2 stor new forest	Convert a barren area of about 900.000 km2 (Germany + France)

ENERGY AND CLIMATE CHANGE

A POSSIBLE SCENARIO FOR 2050

BALI (dec 2008)

194 countries agreed:

2 year negotiation to define the road map with the target of 25-40 % reduction of CO2 emission based on 1990 to be met within 2020

It is an enormous amount of CO2 to be avoided in a short while

GLOBAL WARMING- CLIMATE CHANGE

It is an ethic issue that needs gov actions

- **Commitment of all countries on the planet**
- **Definition of sustainability criteria for any options**
- **Definition of costs and values**
- **Definition of new market regulations**
- **Involvement of all stakeholders since the very beginning**

Governmental Partnerships are political organizations crucial to define and present proposals for decision makers

INTERNATIONAL PARTNERSHIPS FOR THE GHG MITIGATION

4 partnerships have already been set up:

- IPHE hydrogen set up in 2003
- CSLF carbon capture and storage set up in 2003
- M2M methane to markets set up in 2004
- GBEP bioenergy set up in 2006

All 4 very young, but very active: results achieved so far very promising

A new partnership in preparation EEP (Energy Efficiency Partn)



IPHE: INTERNATIONAL PARTNERSHIP ON HYDROGEN ECONOMY

- **16 Country Members + EU**
- **Chair CANADA**
- **Vice-chairs: Italy, USA, China, Japan**
- **Members: Australia, Brazil, Canada, China, France, Germany, Iceland, India, Italy, Japan, Republic of Korea, New Zealand, Norway, Russian Federation, United Kingdom, United States**

- **Secretariat: Canada**

www.iphe.net

CSLF: CARBON SEQUESTRATION LEADERSHIP FORUM

- **21 Country Members + EU**
- **Chair: USA**
- **Vice Chairs: Italy, Australia**
- **Members: Australia, Brazil, Canada, China, Colombia, Denmark, France, Germany, Greece, India, Italy, Japan, Korea, Mexico, The Netherlands, Norway, Russian Federation, Saudi Arabia, South Africa, United Kingdom, United States**
- **Secretariat: DOE**

www.csforum.org

M2M - 19 Partners

Argentina

Australia

Brazil

Canada

China

Colombia

Ecuador

Germany

India

Italy

Japan

Mexico

Nigeria

Poland

Republic of Korea

Russia

Ukraine

United Kingdom

United States

Project Network

Currently more than 480 organizations, including the Asian Development Bank, World Bank, UNECE, Consultants and Project Developers

GBEP - 21 Partners

BRAZIL

CANADA

CHINA

FRANCE

GERMANY

ITALY (Chair)

JAPAN

MEXICO

NETHERLANDS

RUSSIAN FED

UNITED KINGDOM

UNITED STATES

INTERNATIONAL ENERGY AGENCY

UN FOOD AND AGRICULTURE

UN CONF ON TRADE AND DEVL

UN DEPT OF ECONOMIC & SOCIAL

UN DEVELOPMENT PROGRAM

UN INDUSTRIAL DEV ORGANIZATION

UN FOUNDATION

WORLD COUNCIL RENEW ENERGY

EUROPEAN BIOMASS IND ASSOC

IEA

FAO (segr)

UNCTAD

UN/DESA

UNEP

UNIDO

UNF

WCRE

EUBIA

GBEP – 9 OBSERVERS

AUSTRIA

INDONESIA

ISRAEL

KENIA

MOZAMBIQUE

SOUTH AFRICA

SWEDEN

TANZANIA

EU

BIOENERGY- Status as per today

- Bioenergy 10% of the total primary energy worldwide
- Bioenergy 78 % of the overall renewables
- Solid biofuels 97 % of the total biomass
- Biomass use 71% cooking and heating
- Liquid biofuels 0.03 % of the primary energy
- Bioethanol 16.5 MTOE (Brazil-USA 90%)
- Biodiesel 2.4 MTOE (Germany- France- Italy 90%)

GBEP OBJECTIVE

- **CREATE THE BEST ENVIRONMENT FOR A SIGNIFICANT INCREASE OF SUSTAINABLE BIOENERGY WORLDWIDE IN BOTH STATIONARY HEAT AND POWER GEN AND IN AUTOMOTIVE**

FIRST GENERATION BIOFUELS

- **Bioethanol** from crops as an alternative to food market (sugar cane, corn)
- **Biodiesel** from oil seeds (soybean, rapeseed, palm, sunflower) with trans-esterification with methanol (ethanol eventually) as an alternative to food market

SECOND GENERATION BIOFUELS

- **Bioethanol** from optimized sugar crops (sweet sorghum) in set aside area, in arid area or in poor soil
- **Cellulosic Ethanol** from agriculture cellulose waste (corn stalks, straw) – Integrated agriculture-energy
- **Biodiesel** from optimized crops (Jatropha, Honge) - no food competition (tropical and subtropical area)
- **Bio-oil** (SVO) for adapted diesel engines for generators and tractors (when alcohol is not available or infrastructures inexistent)
- **Biodiesel** from hydro-refining of raw bio-oil (no more glycerin by-product)

THIRD GENERATION BIOFUELS

- **Cellulosic bioethanol** from rotating wood plantations through cellulose hydrolysis (Italian cane)
- **Bio-oil or biodiesel** from algae cultivation with CO₂ from power gen
- **Bio FT diesel** from any biomass gasification (waste)
- **Bio n-butanol** from biomass fermentation (as co-solvent for ethanol/methanol-gasoline blends, or as chemical)
- **Bio-hydrogen** from selected biomass fermentation

FOURTH GENERATION BIOFUELS

- **Bio-H₂** from LT water photolysis through micro-organisms as catalyst

BIOFUELS IN G8+5 COUNTRIES

Bioenergy in the global energy contest

- Bioenergy overview
- Bioenergy contribution to the world energy supply
- Bioenergy consumption in G8+5

Policy overview

- Policies across countries
- Regional policies
- Sustainability and trade consideration

Country profile and bioenergy data per G8 +5

Regional profiles

- (EU, NAFTA, ASEAN, MERCOSUR, CBI, CAFTA)

POLICY OVERVIEW IN G8+5 COUNTRIES

- **Principal policy mechanisms being deployed**
 - Feed-in tariff
 - Taxes
 - Guaranteed market
 - Compulsory grid connections
 - Other direct supports on R&D&D
- **National targets and public incentives systems**
- **Government's current move towards performance focused policies**
 - GHG reduction required rather than mandate on amount of fuels to be consumed
- **Recognition that not all biofuels are “green”**
- **Sustainability criteria need to be agreed upon internationally**
- **WTO does not currently have a trade regime specific to biofuels. The current move towards technical standards regionally and internationally is addressed**

GBEP: Harmonization of GHG methodologies

US is the GBEP leading Partner on biofuels for transportation
Germany is the GBEP leading Partner on solid biomass

Main Objectives:

- Develop a harmonized methodology to be used by policy makers in all countries**
- Develop a template or best practice guidance in the harmonized methodology for conducting GHG lifecycle assessments**

GBEP: GHG for transportation

- **US hosted first GBEP Task Force meeting Oct 2007**
- **Participants from Canada, France, Germany, Italy, Japan, UK, US, ENEP, UNF, ICCT, UCB, ISU**
- **Group decided it possible to develop a checklist of common elements to be included in a GBEP methodology**
- **Second meeting March 6-7 in Washington: A further step towards a common methodology (GBEP-EU-IEA and others)**

MAIN COMPONENTS OF A CHECKLIST

- 1. GHGs to be included in checklist**
- 2. Direct land- use change**
 - Above-ground biomass
 - Soil carbon
- 3 . Production cycle**
 - Farm/forest to plant gate
 - Plant gate to tank
- 4. Wells to wheels**
- 5. Comparison to petroleum fuel replaced**

PLANT GATE TO TANK

This aspect is crucial:

Production of bio-diesel in a tropical country needs to bring methanol there from Venezuela and back bio-diesel from such tropical country to the international market (CO₂ emission for logistic of both methanol in and bio-diesel out)

Production of bio-oil in the tropical country and use it as SVO for domestic demand and avoiding oil import (CO₂ emission saved in comparison with the above)

Import of bio-oil from tropical countries to Europe and refine it in refinery

Production of bio-oil in Europe and use it as fuel for large low speed diesel engines in substitution of diesel)

SUSTAINABILITY CRITERIA

- **Competition with food**
- **Protection of biodiversity**
- **Management of land**
- **Management of water**
- **Control of air, soil, waters pollution**
- **Social impact on urbanization**
- **Keeping people on rural area**

ECONOMICS

- **Global warming- climate change means a new global commitment for the GHG mitigation**
- **Biofuels should compete in the fuel market, but the fuel market regulations should be drastically modified in order to meet the target**
- **Biofuel business should not be based on the oil price only**
- **A shared CO₂ value should be defined to cover the extra cost of biofuels compared with fossil fuels**

MARKET DEVELOPMENT

- **First gen biofuels: increase sustainable production worldwide competing in a new fuel market**
- **Second gen biofuels: demo units –cost sharing industry and govs; **early market start up- import from dev countries****
- **Third gen biofuels: genetic research - pilot units with prevalent public funds**
- **Forth gen: basic research- mainly with public funds**

GBEP could help in the harmonization of all these activities through an integrated **WORLD BIOFUELS PROJECT**

KEY MESSAGES

- **Growth in bioenergy needs to be carefully managed if we are to make the most of its benefits on 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 biofuels are essential for the climate change mitigation**
- **Next generation biofuels are likely to provide large amount of biofuels in a short while**
- **Bio-fuels development is already in progress**
- **Capturing the full potential of biofuels means overcoming environmental and social constrains and removing trade barriers.**
- **Economics and competition need a change in the market regulations**

FOR FURTHER INFORMATION

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www.globalbioenergy.org