

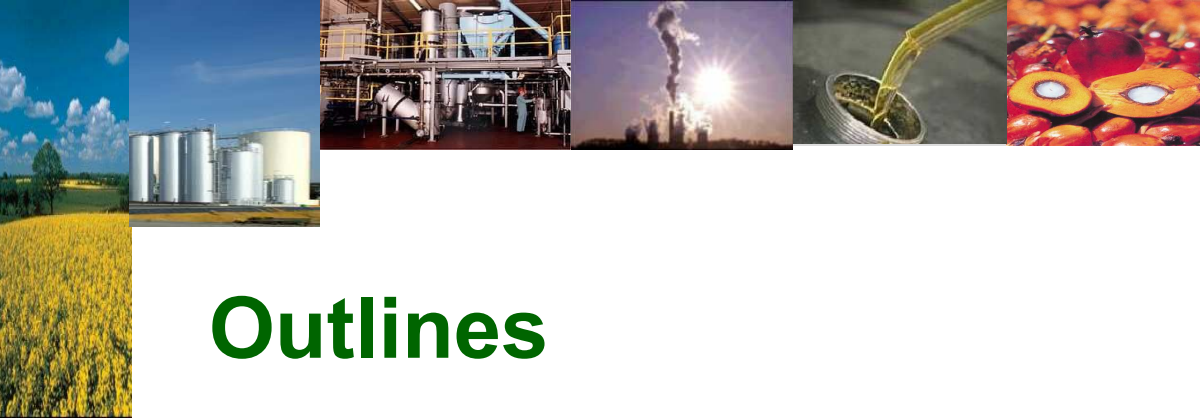


Biofuels Production and Use: Drivers and Concerns

Workshop on Promotion of Sustainable Biofuels production
in Central and Eastern European Counties

12-13 Nov. 2007, Cavtat-Dubrovnik Croatia

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Outlines

- The issue : drivers and concerns
- What is biofuels?
- Which potential benefits
- What are the concerns?
- How to assure environmental, economic and social sustainability



Present international debate

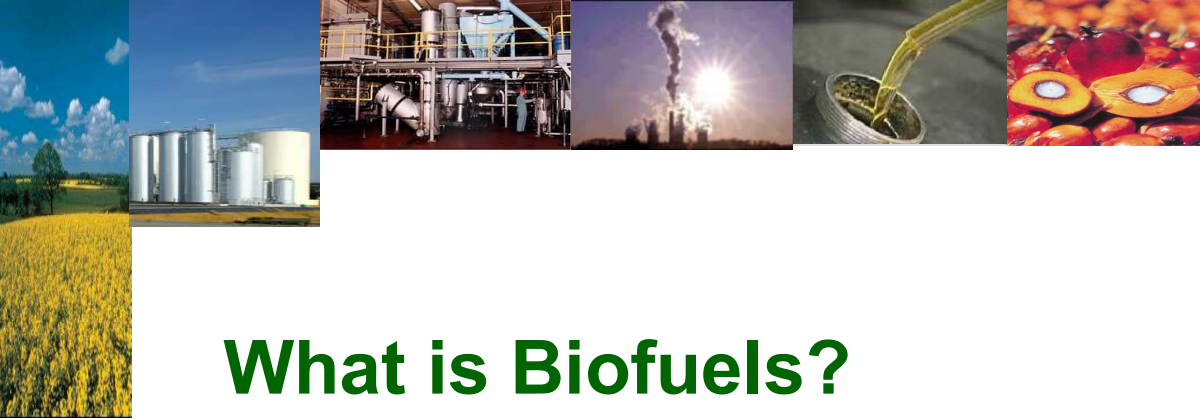
...consider Biofuels as potential solution to

- Increase security of energy supply that is being undermined with various geopolitical conflicts
- Revitalise rural and agriculture sector
- Reduce CO₂ and other emissions from transport sector
-



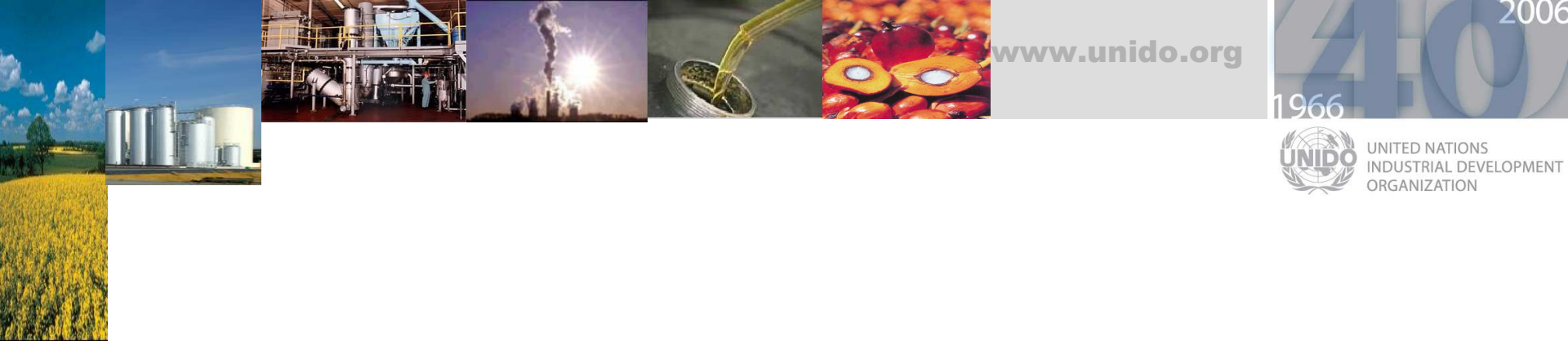
Present international debate

- Legislations put in place by EU and other regional institutions, to promote biofuels production and use of biofuels, ⇒ market demand is created ⇒ biofuels became now an international trade commodity
- This market is seen by many countries, having arable land, labours and appropriate climate conditions, as a developmental opportunity
- With this come concerns and **uncertainties** as to the **sustainability** of the biofuels and potential **negative impacts** on food security, water, land use, biodiversity, social and ethical issues, etc.

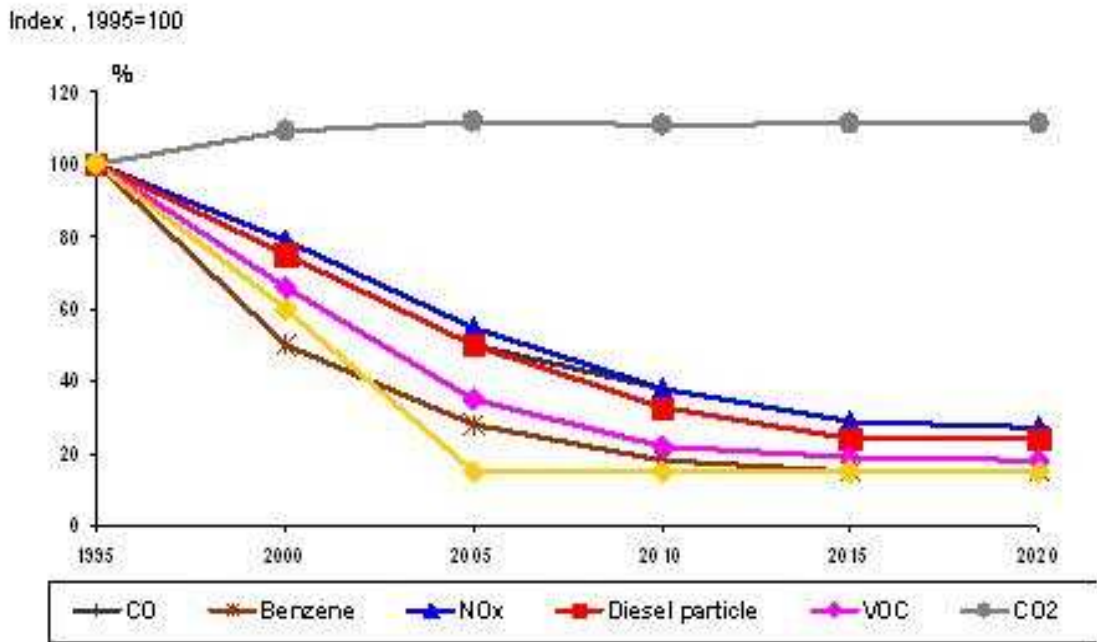


What is Biofuels?

- Mainly **Bioethanol & biodiesel** is biomass based transport fuel (also for stationary application-internal comb. Engines)
- It can substitute fossil fuels in vehicle either as **100%** or partially as a **blend**



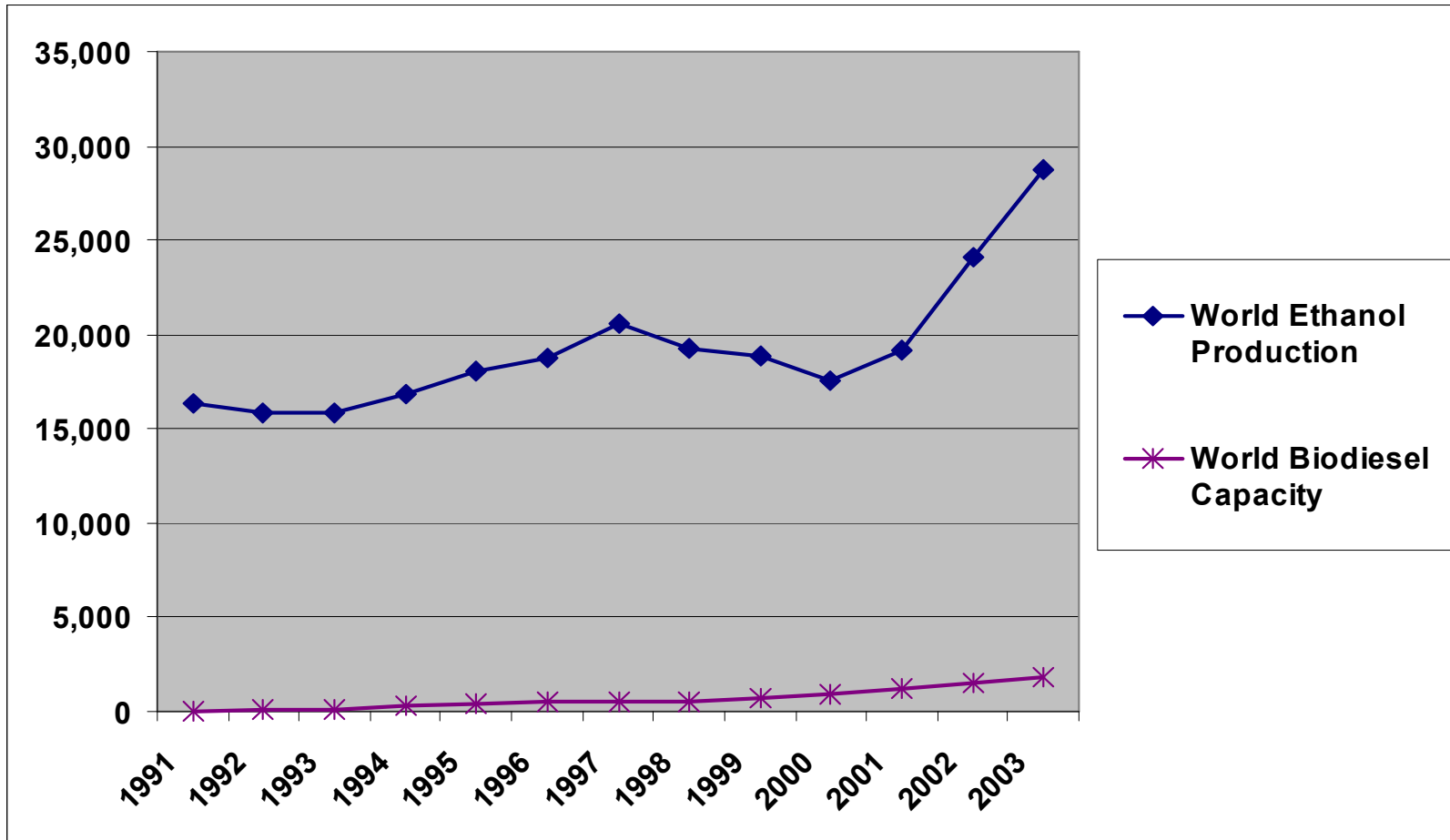
- ❑ Transport sector is responsible for 22-25% of CEE CO2 emissions
- ❑ It is a growing source of emissions
- ❑ In short term, **biofuels** are expected to contribute to reducing CO2 from transport
- ❑ In longer term, **Hydrogen**



Source: Emissions from road transport in EU25
 Source: Auto II Programme- European Commission



Worldwide production of biofuels in Million liters per year



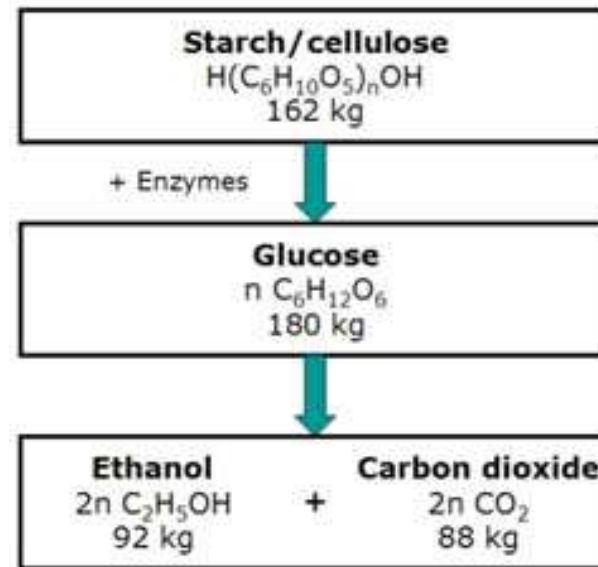
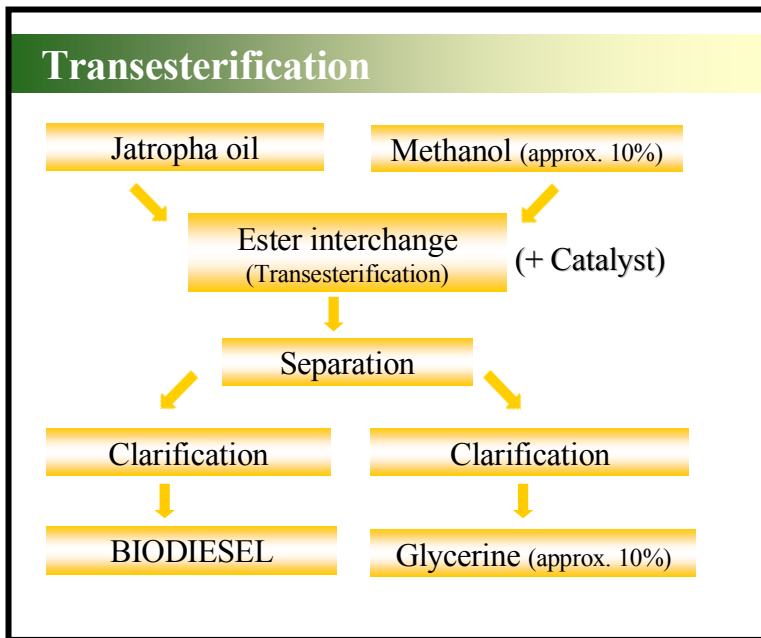
Source: F.O. Lichts



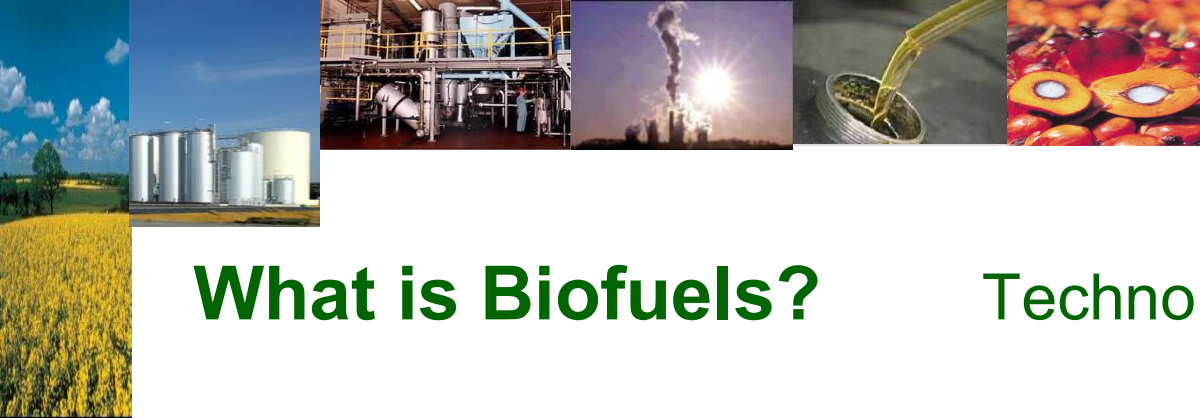
What is Biofuels? Technologies

■ 1st generation biofuels/technologies

- Biodiesel through **transesterification** of oil seed (rapeseed, soya, sunflower) or used oils and greases
- Bioethanol through **fermentation** of sugars (beet, s.cane) grains (wheat, corn)



Source: EUBIA



What is Biofuels?

Technologies

■ 2nd generation technologies

- Synthetic diesel through biomass **gasification** F-t, hydrothermal upgrading, depolymerisation, etc.
- Bioethanol through **fermentation of cellulosic** materials (wood, grass, agri. Waste)

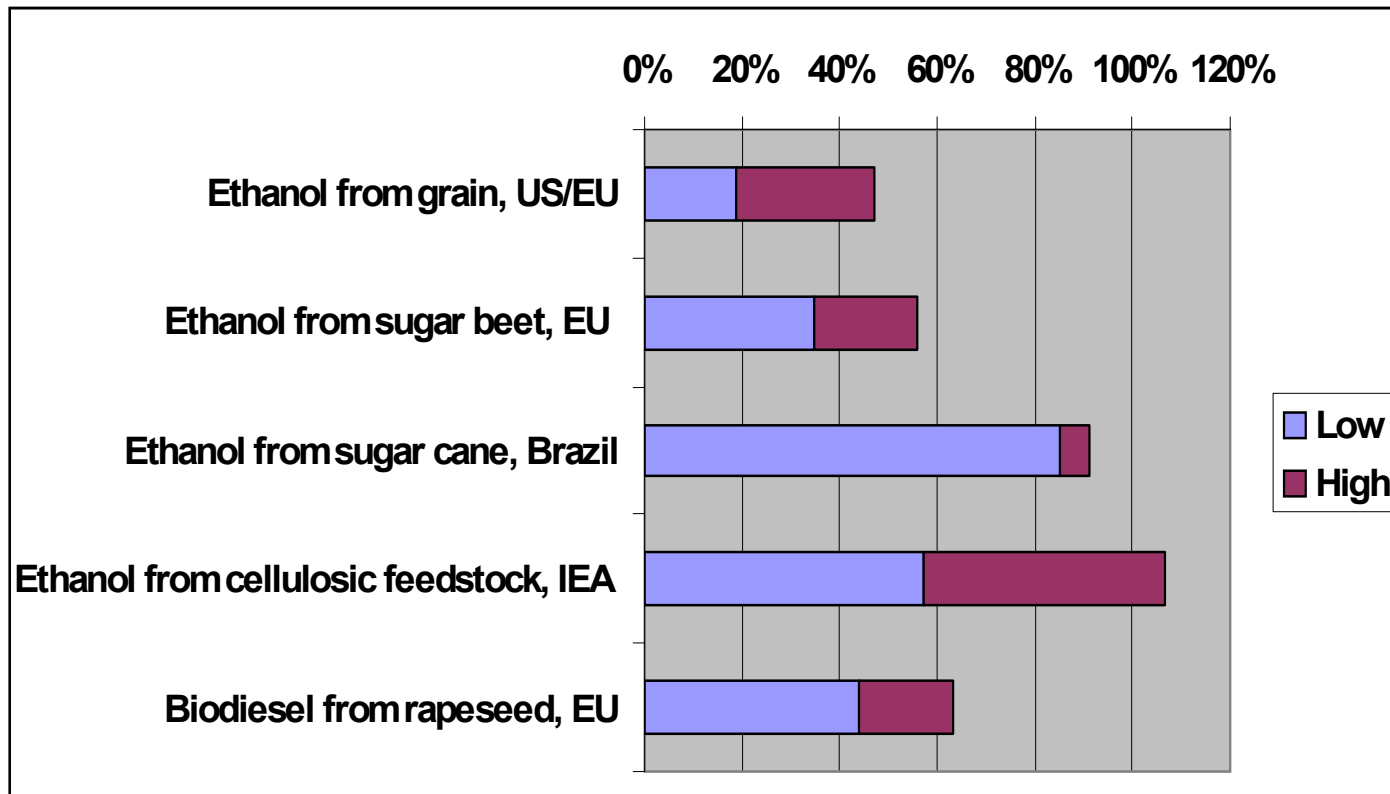
■ 2nd generation are expected to have many advantages over the present ones

- Using a wider range of feedstock that are more available and less expensive leading to cost competitive biofuels, and lowering the **pressure on land**
- Lowering the well-to wheels **GHG emissions**



GHG Reductions Significant, but Vary by Feedstock and Technology

Reductions in well-to-wheel CO₂-equivalent GHG emissions per km, from biofuels, compared to gasoline (for ethanol) and diesel fuel (for biodiesel)



Source: Courtesy of IEA



Some of Benefits seen in Biofuels:

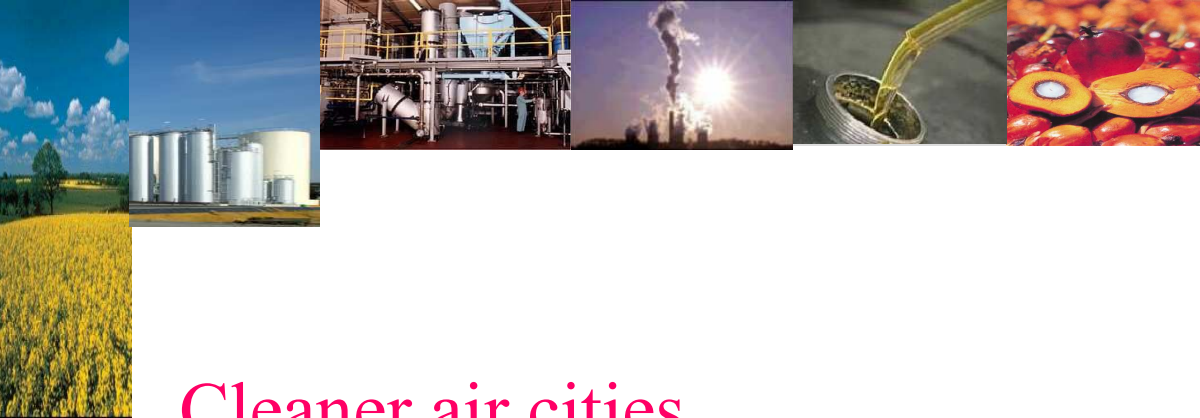
Macro-Economical Benefits

Employment creation

Conservation of foreign exchange by reducing import quotas
and improving country's balance of payments

Benefits for Engine

Biodiesel optimized viscosity and thus, reduction of engine
wear



Cleaner air cities

Air pollution in cities: could be reduced significantly, biodiesel results in substantial reductions of:

unburned hydrocarbons (67%)

carbon monoxide (47%)

particulate matter (47%)



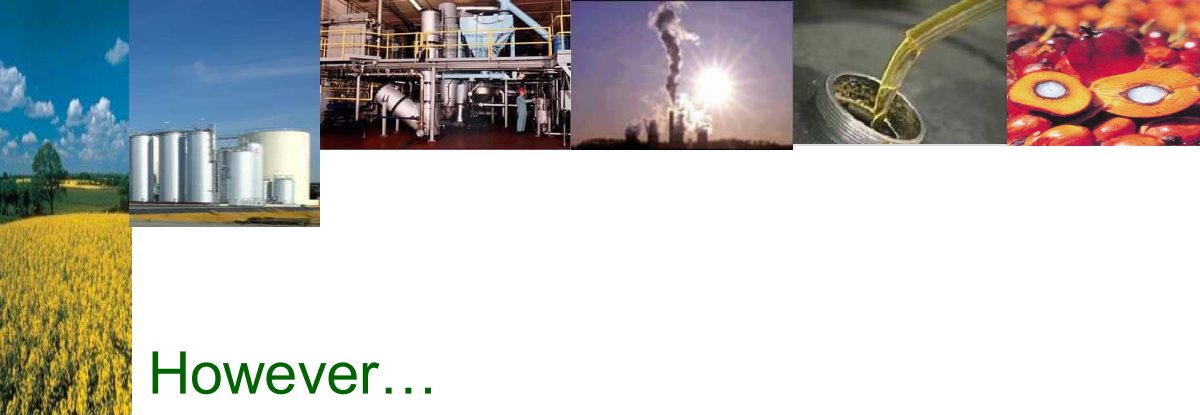


Air pollution:



Graphic source: © University of Hohenheim

- Emissions of NO_x are slightly reduced or increased (10%) depending on the engine and testing methods used.
- However, biodiesel's lack of sulphur allows the use of NO_x control technologies that cannot be used with conventional diesel (containing sulphur); Therefore, effectively managing NO_x emissions from biodiesel



However...

Risks and uncertainties are voiced regarding

- Competition on **land use**, for food or fuels, and the impact on **food security** and prices
- Competition for **water** resources which is already a in short supply
- Negative impact on **GHG** resulting from changes in uses of reserves zones, such as rain forests
- **Soil erosion** and water **pollution**
- Negative **socio economic** impacts on vulnerable communities
- ...



...

Risks and uncertainties are voiced regarding

- These are concerns usually debated within the frame of **environmental** and **social sustainability** of biofuels
- However, there are also concern about the **economic sustainability** of biofuels production
- E.g., cost of biodiesel from rapeseeds is ~0.52 to 0.65 Euro/l (**before taxes**) depending on plant capacity
- Price of diesel (at station, i.e., **after taxes**) is ~ 0.65 Euro/l



...

Risks and uncertainties are voiced regarding

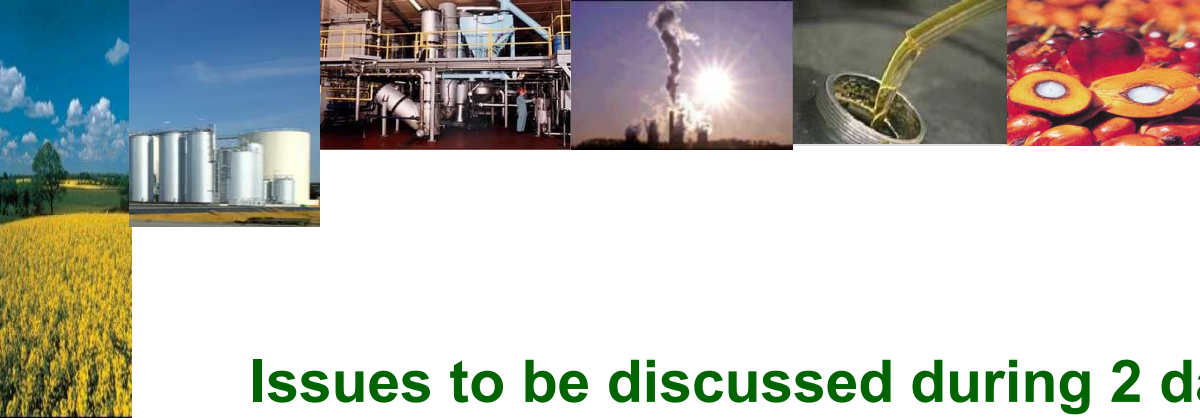
- Obviously, some **policy, financial measures and incentive** have to be in place to enable market penetration of biofuels
- In addition, **dissemination of experience** and lessons learned in order to **reduce the production cost** are also needed



In conclusion..

In order to capture the benefits of biofuels production and use and avoid risks, there is a need for:

- Identifying and streamlining appropriate **sustainability standards** and **certification** schemes
- Accelerate **technological advancement** to reduce land/ feedstock needed per unit biofuels produced
- There is certainly a room for improving **agricultural land productivity**
- Sharing of knowledge on **best practice** of industrial optimisation to **reduce production costs** and business vulnerability
- Putting in place **appropriate policies** and **financial mechanisms** promoting the production and use, with reduced impact on state tax revenue



Issues to be discussed during 2 days workshop

- Policy and Mechanisms Promoting Sustainable Biofuels
- Feedstock, Sustainability Issues and LCA Analysis
- Existing and Emerging Process Technologies
- Regional and International Issues – Industrial Perspectives



Expected outcome

- Sharing of knowledge on issues discussed
- More insight on present situation plans and potential for biofuels production in CEE
- Needs identification and recommendations as to the way forward, also in view of regional integration



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Thank you for your
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