US-EC Workshop on

biotechnology for sustainable bioenergy

Bioenergy production: Elements of an environmental assessment framework

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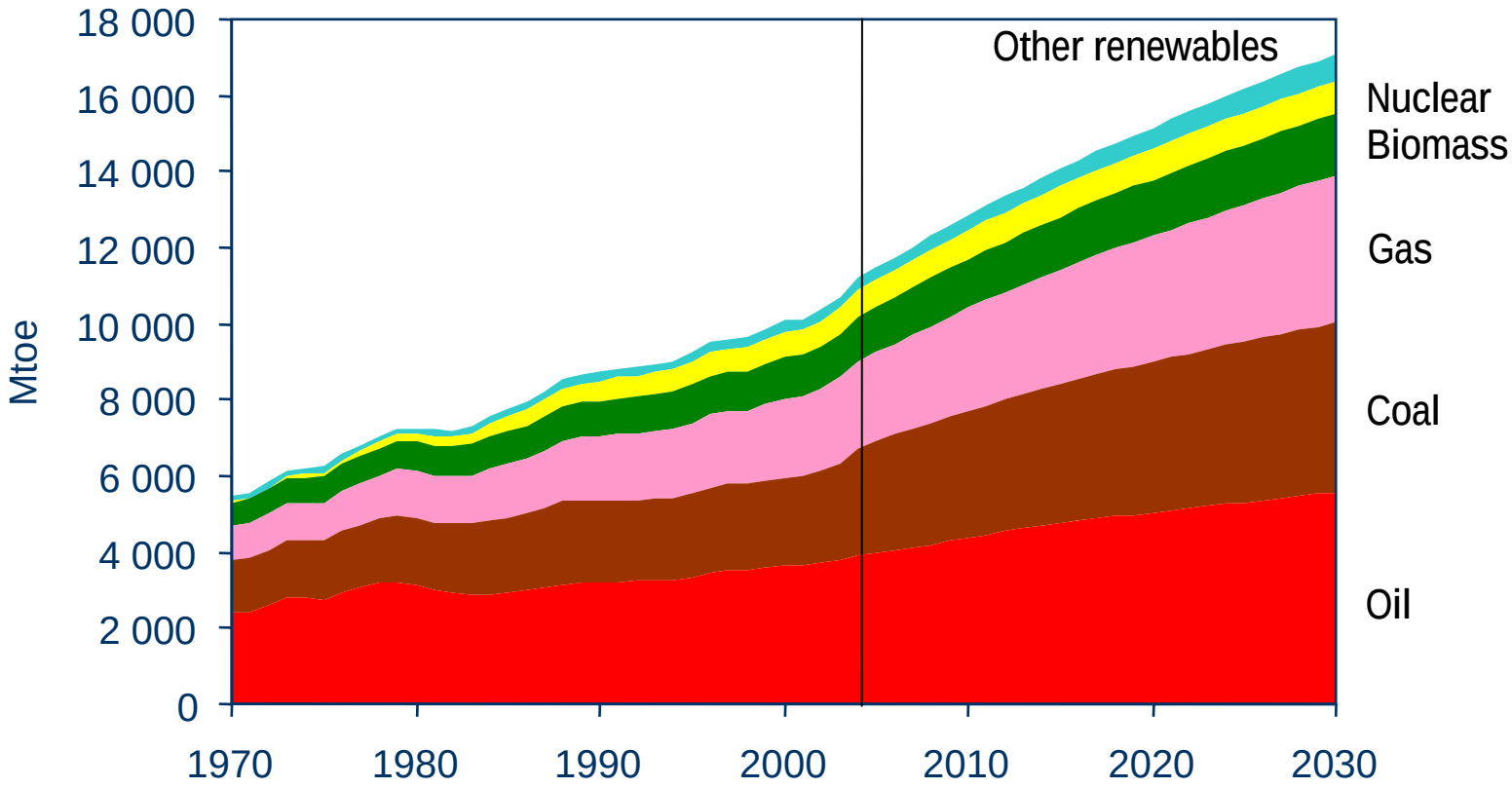
European Environment Agency

IEA Reference Scenario: World Primary Energy Demand

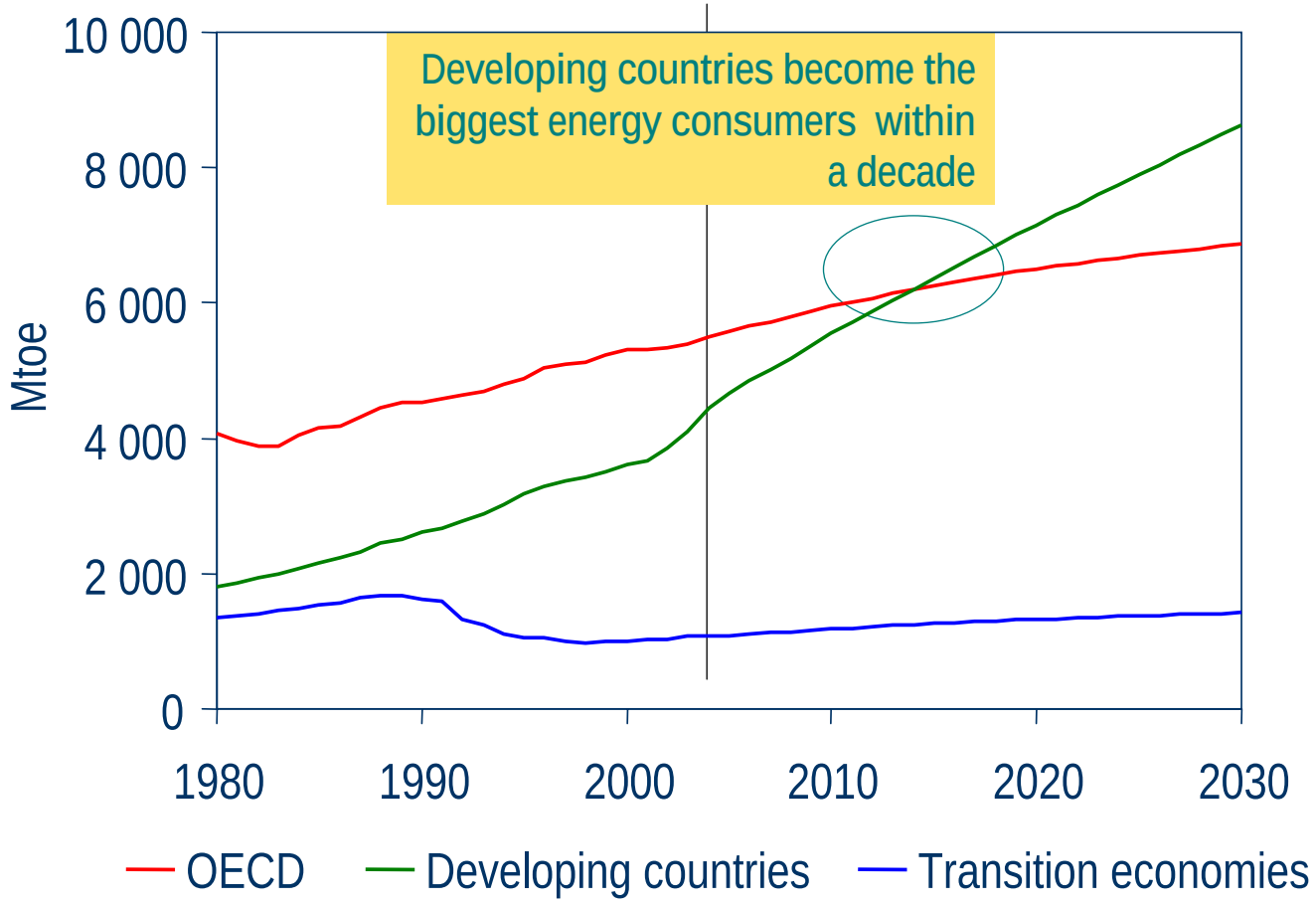
Global demand grows by more than half over the next quarter of a century, with coal use rising most in absolute terms



IEA Reference Scenario:

Primary Energy Demand by Region

World oil demand grows by just over half between 2004 and 2030, with 70 % of the increase coming from developing countries



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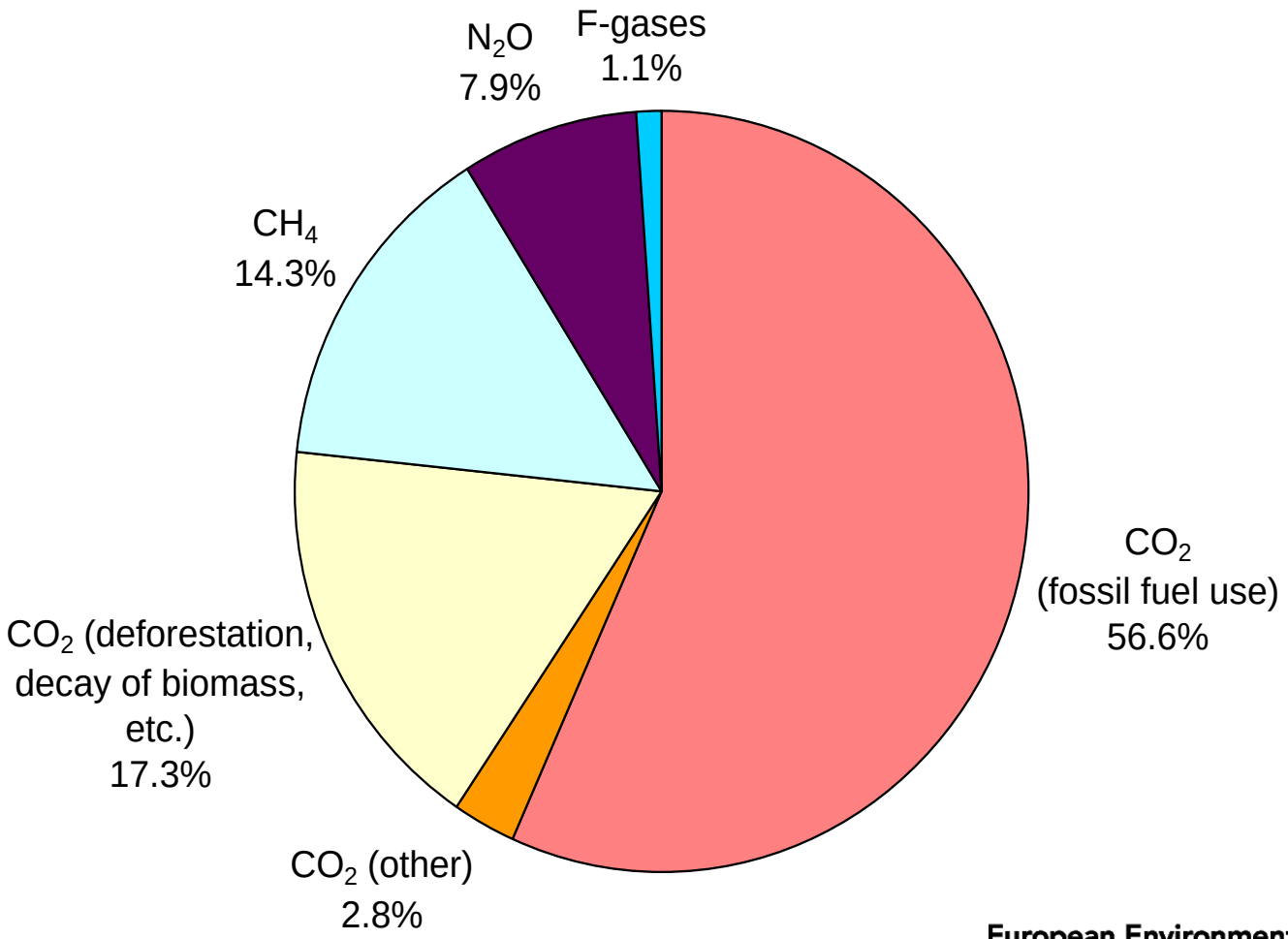
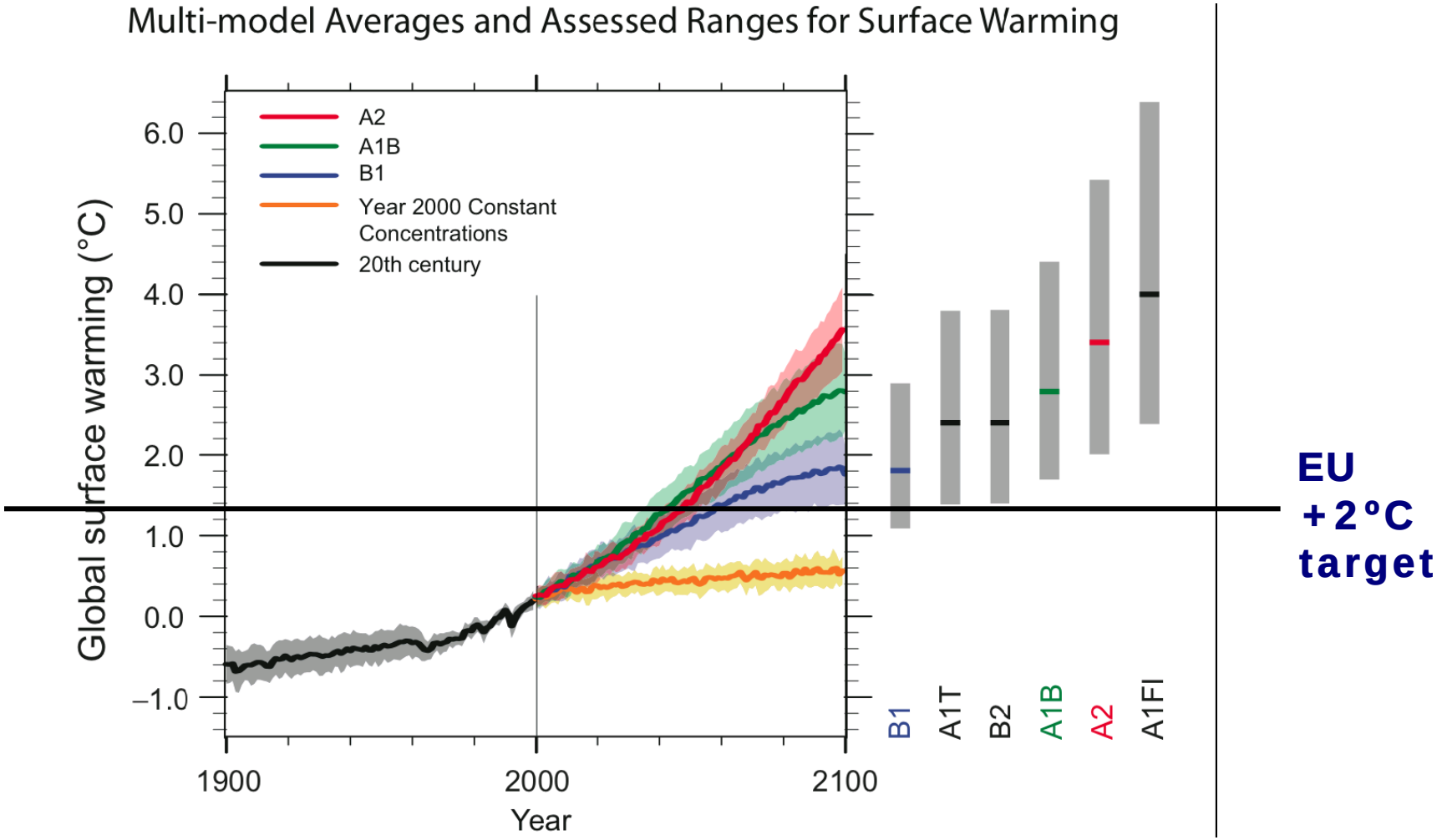
Global Greenhouse Gas emissions by source in 2004 (IPCC, 2007)



Substantial global GHG emission reduction (-50% by 2050) is needed as well as adaptation



Source: IPCC fourth assessment, 2007 (full uncertainty range for temperature increase is 1.1-6.4°C)

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Wood collection in poor countries

Source: www.radford.edu

Bioenergy + the management of natural resources

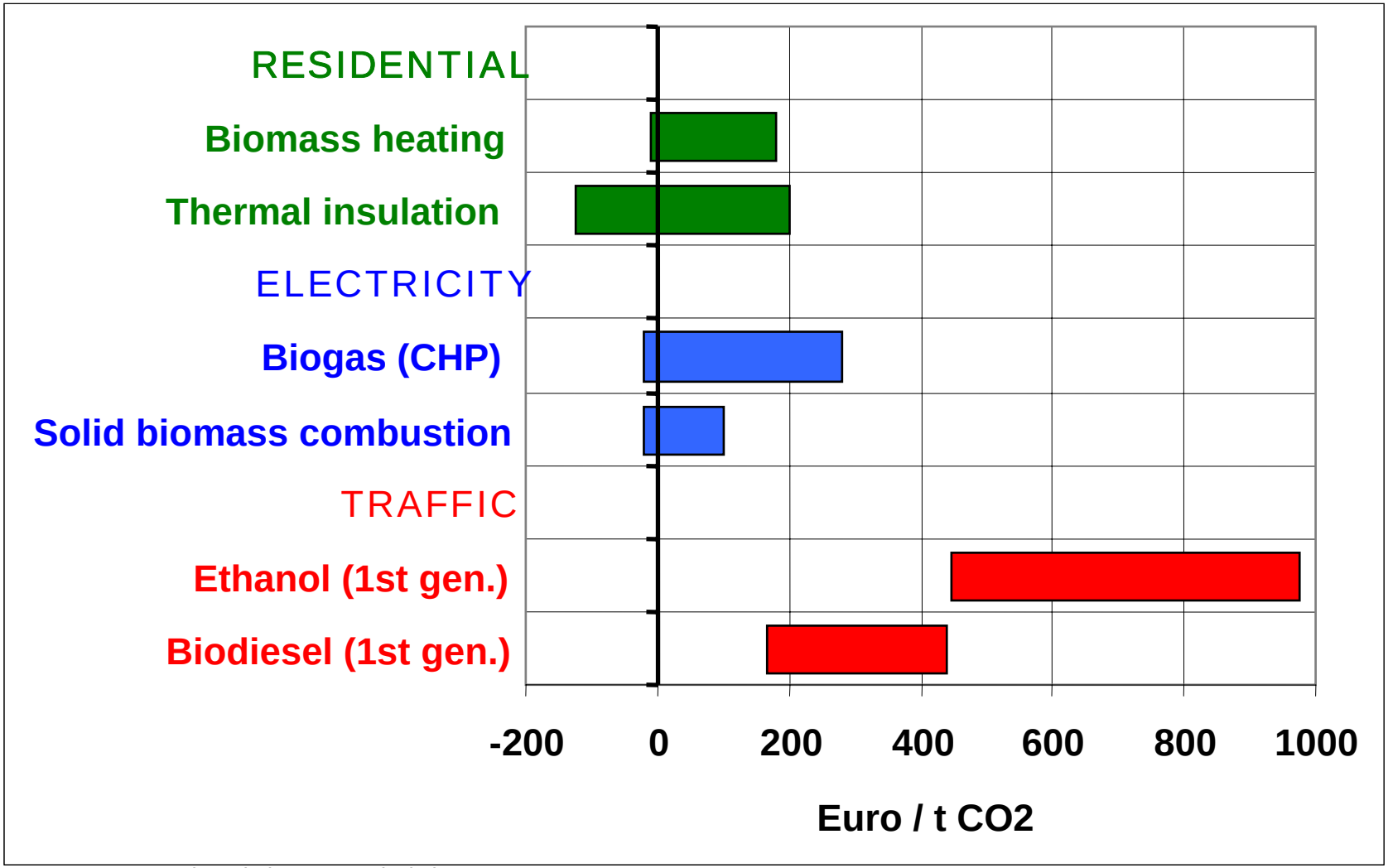
- Need to increase renewable energy production
- Climate change as key problem – consider carbon loss / storage
- Great pressure on productive land and forests
- Bioenergy production needs to be compatible with carbon + other environmental challenges
- Start from current agricultural+social situation
- Increase resource use efficiency!

Develop biomass sources that do not compete with food production, forest conservation and minimise land requirements

Develop only the most efficient bioenergy pathways

Present CO2-Mitigation cost

(approximate values)



Surces: IEA, Heissenhuber, own calculations

Utilise waste products with priority and develop energy cascading

Develop bio-energy technologies that can cope with grass / mixed sources of biomass

Approaches to bioenergy need to be adapted to the local/national situation (consider the financial, technical + social capital requirements of systems)

Some critical issues

- Development of environmental assessment frameworks (what is ‘degraded land’ ?)
- How to set the system boundaries for modeling (spatial+time scales, alternative land uses, policy areas affected)
- Which are the right policy instruments to steer bioenergy in the ‘right’ direction: sustainability criteria, carbon trading/taxes, support to research/technologies, rural/regional/ international development tools
- Global to local governance as key challenge
- Knowledge transfer + communication..

Some conclusions and recommendations

1. **Biomass offers a very versatile source of renewable material + energy -> we need to develop the most efficient ways of using it; use cost-benefit + economic analysis**

2. **Developing countries need support to use their biomass in a more sustainable way (it does not matter where a ton of fossil fuel or carbon is saved..)**

3. **Biomass is only one of the renewable energy options; solar seems to offer the higher energy yield per ha of land; and do not forget energy efficiency etc..**

Source: BMVBS

Potential for US-EC cooperation

- JRC – EEA workshop on sustainability standards – autumn 2008
- Framework for LCA analysis – GBEP, UN bodies, EEA workshop in June 2008
- Potential workshop on linking agro-economic + biophysical models for analysing bioenergy production at the OECD
- Informal exchange of information..

Thank you for your attention !

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Knowledge transfer – a comment on Sir Howard Newby remarks..

- For EEA and the academic world: results need to be digestible for busy policy makers (robust + relevant..)
- A question of balance + bottlenecks: