International Transport Forum

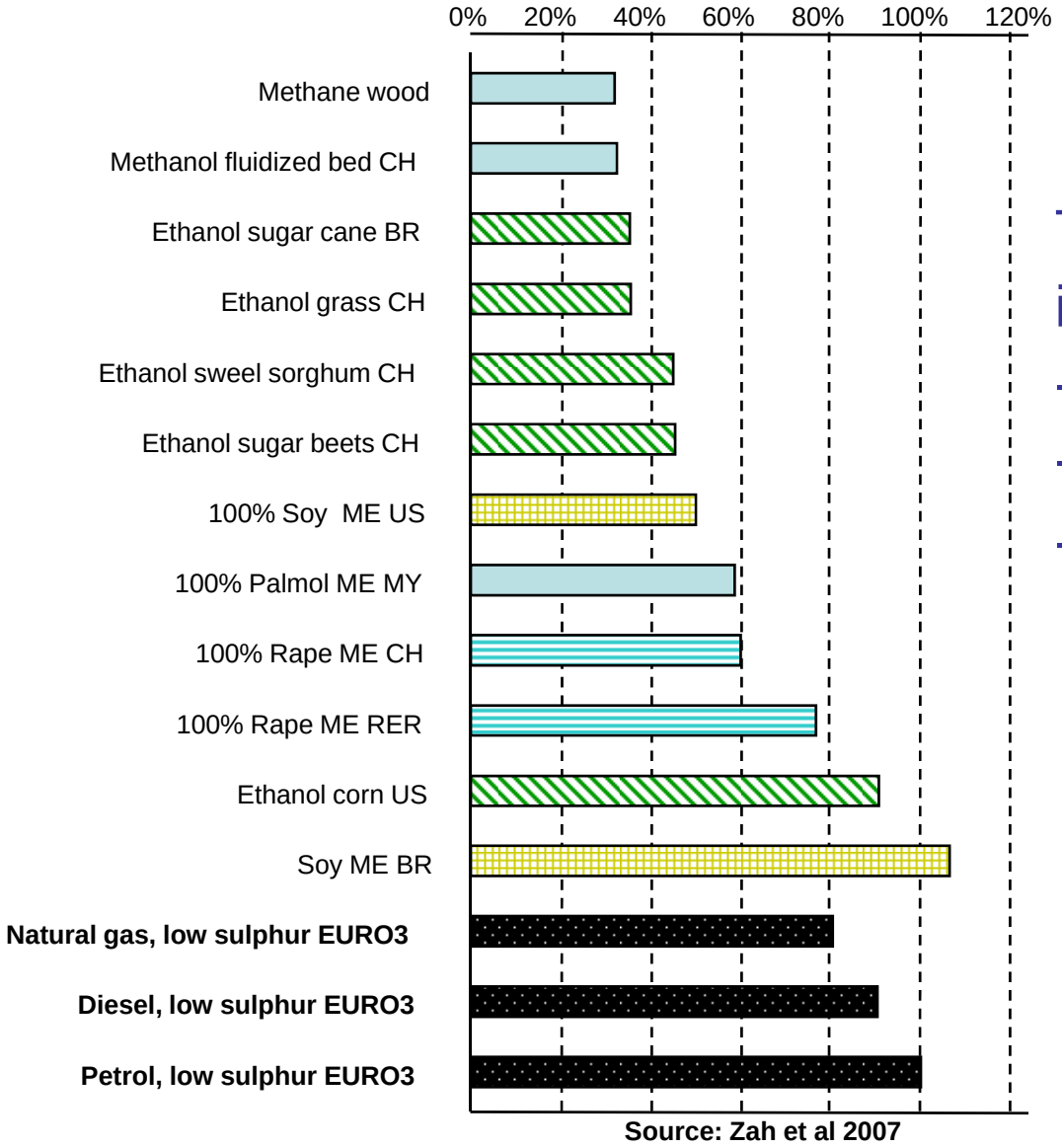
OECD

Biofuels:
Linking Support to Performance

Round Table, 7-8 June 2007

Summary of discussions

Estimated greenhouse gas warming potential of biofuels relative to conventional fuels



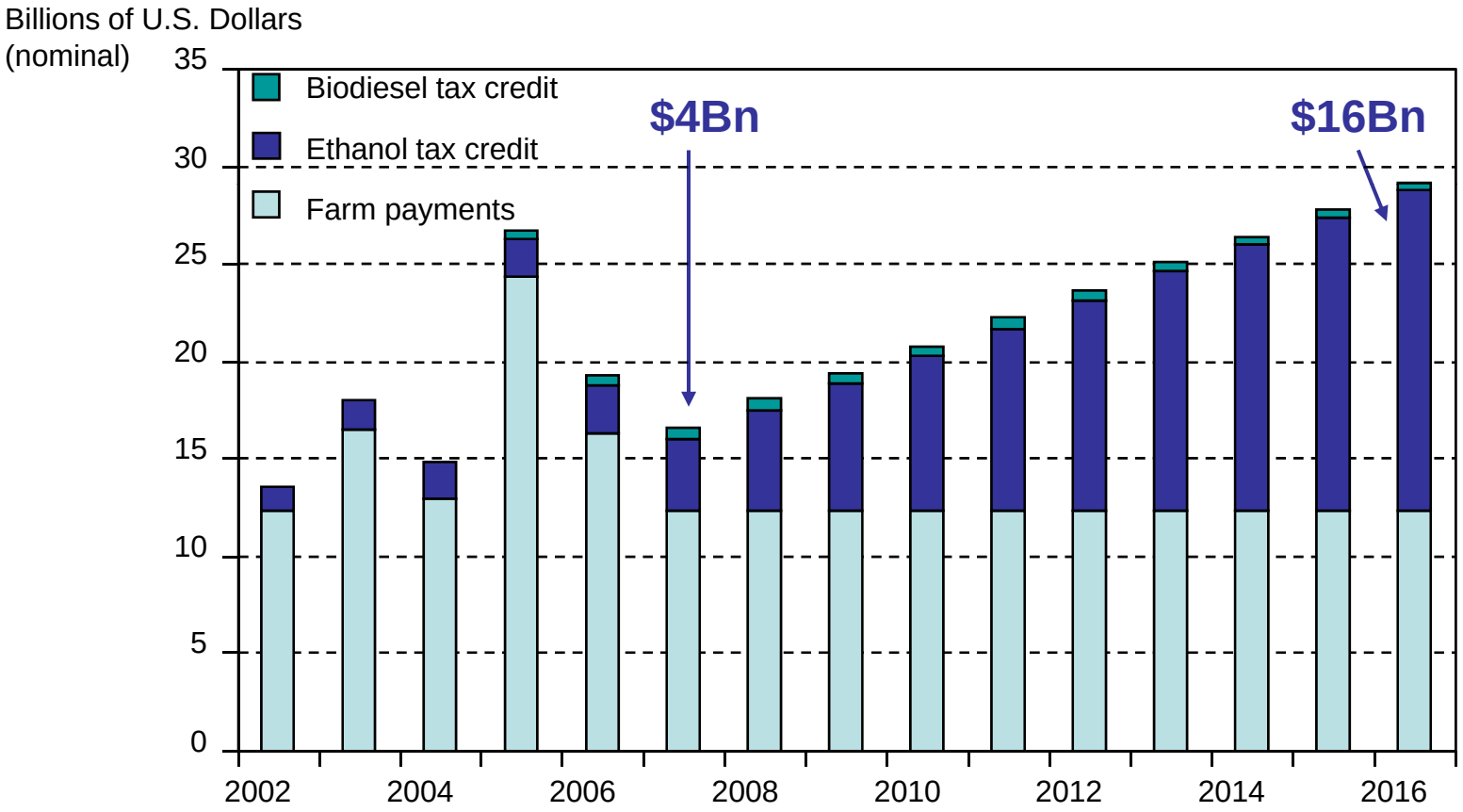
Source: Zah et al 2007

The measurable greenhouse impact of biofuels varies with
- feedstock;
- farming practices and
- energy used for processing.

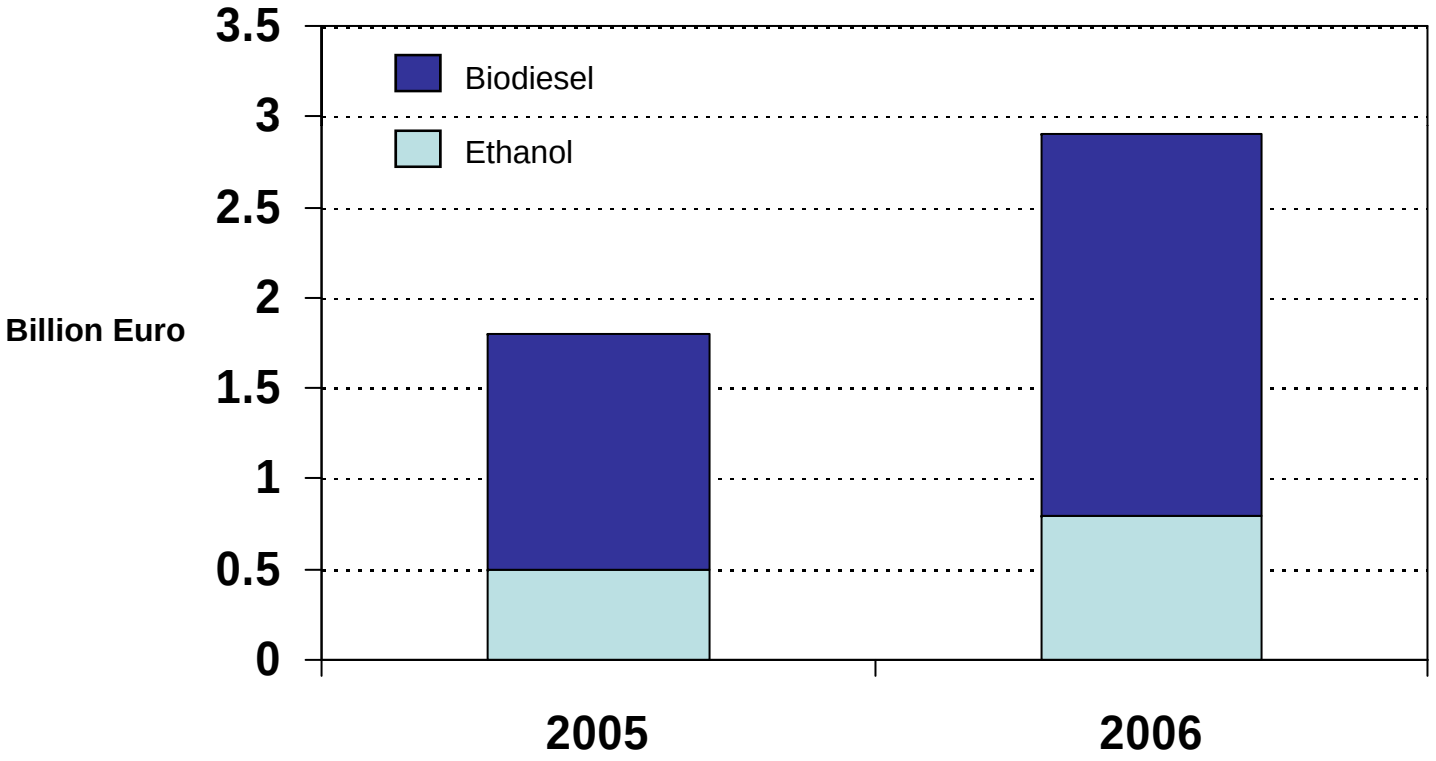
Significant support provided to biofuels

- Core part of many national CO_2 policies
- Subsidies in OECD in 2007 ~ **$15 billion**
- EU biofuel targets (% share of transport fuels)
  - 2007: 2%
  - 2010: 5.75%
  - 2020: 10% proposed by Parliament
- US targets
  - 4 billion gallons of ethanol in 2006 (2.78% gasoline mkt.)
  - 7.5 billion gallons of ethanol by 2012
  - 35 billion gallons of biofuels by 2017

US: biofuel subsidies facing rapid growth



EU tax subsidies also increasing rapidly



Biofuels: high-cost option for greenhouse gas reductions

Average subsidy per ton of $CO_{2\text{-eq}}$

US corn-ethanol	**€390**	**$520**
EU sugar-beet ethanol	**€450 - €620**	**$610 - $840**
EU rapeseed biodiesel	**€750 - €990**	**$1 000 - $1 340**

Sources: Koplow 2007; Kutas *et al.*, 2007

Unintended consequences

- Food and livestock feed prices
- Soil erosion
- Water abstraction and pollution
- Biodiversity threat from land use change, monoculture and pesticides

Fossil energy savings and GHG emissions

- Wide range of uncertainty in the estimation of life-cycle energy and GHG emission balances;
- Farming practice can shift the balance from positive to negative;
- Oxidation of soil carbon and emissions of N_2O from fertiliser application are big sources of GHG emissions.

Which biofuels to support?

- Not all biofuels equally effective—some are counter-productive
- Brazilian sugar can perform best, but still requires subsidy
  - Sugar requires less processing than starch
  - Cane yields are high
  - Heat for distilling ethanol is produced from cane waste, together with electricity sold to the grid
- Research into some second generation fuels useful
  - Ligno-cellulosic ethanol from some feedstocks performs better than any conventional biofuel

Designing support for biofuels

- **Volumetric targets inappropriate**
  - Likely to favour worst performing, lowest cost production
- Transport fuel **carbon content targets better**
- **Certification** for biofuels production
  - Potential to improve outcomes even if barriers currently exist
  - Methodology for direct CO_2 emissions maturing and most direct environmental costs can be measured
  - Difficult to include indirect effects, such as forest destruction and loss of biodiversity
  - Requires extensive stakeholder consultation
  - Crude system should be better than no certification

… designing support for biofuels (cont.)

- UK, NL, Germany, Switzerland, California, EU developing certification to regulate market
- Range and poor performance of today's biofuels partly the result of absence of regulation or incentives linking support to CO_2 balance
- Fuel carbon taxes, including for biofuels, would be more cost-effective than direct subsidies or targets

Support levels may be unsustainable

- **Unrealistic biofuel projections** of major share in energy supply
  - Supplying 25% of US energy supply would require 50% of all ecosystem production in US
  - Biofuels currently require subsidies in excess of their contribution to abatement
- Subsidising large scale production/consumption
  - Fails to deliver security or ghg emissions reduction
  - Expensive and inefficient way to support rural economies
- Explosion in subsidies likely to be cut back later

Future potential

- Future biofuels could have lower ghg emissions than today's technologies
  - if support provides incentives for improvement
- They may provide cost-effective emissions reductions, although probably on only a limited scale
- Ligno-cellulosic ethanol may be capable of supplying a few percent of transport fuel sustainably