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# USDA Agricultural Outlook Forum 2007

## EU BIOFUELS POLICY AND EFFECTS ON PRODUCTION, CONSUMPTION AND LAND USE FOR ENERGY CROPS

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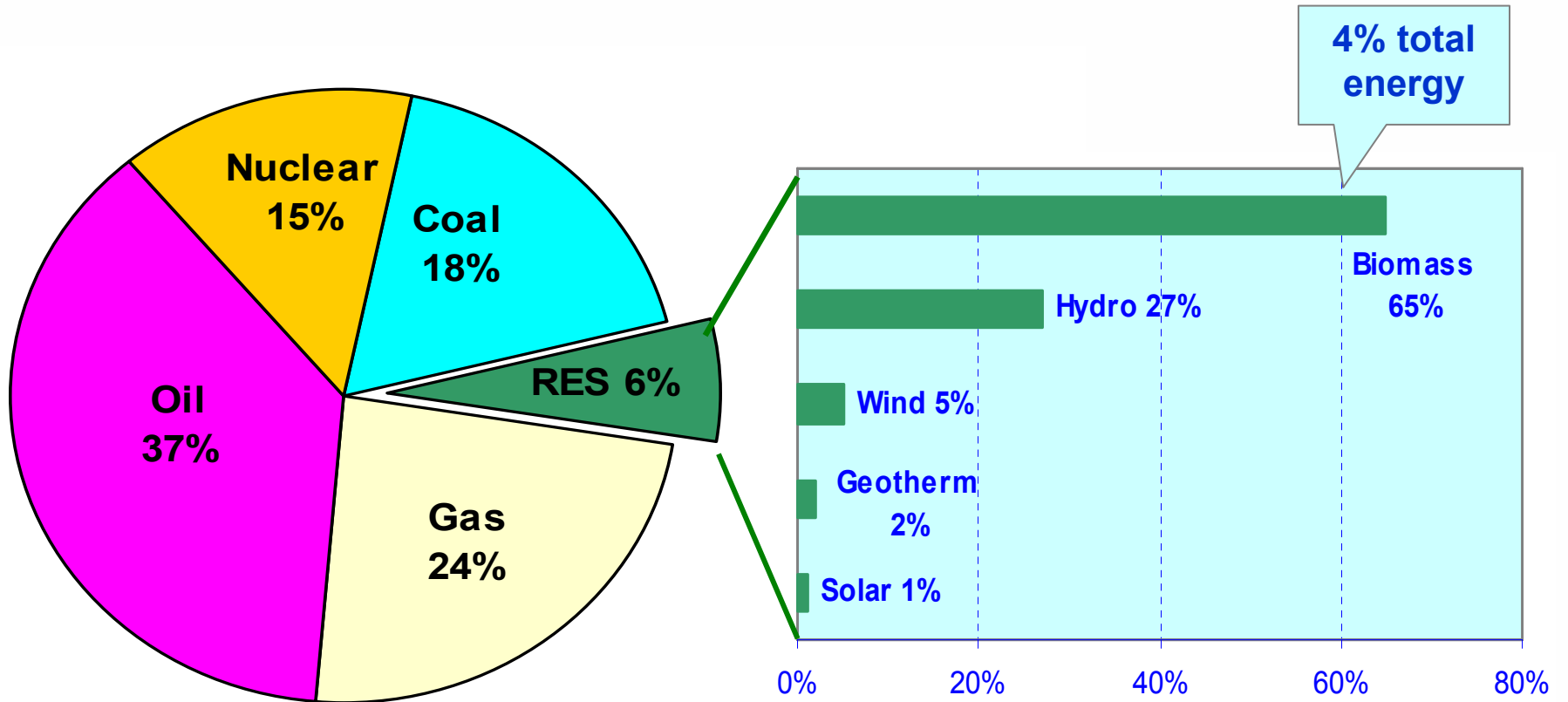
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# Breakdown of EU-25 gross energy consumption



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## EU Policy for renewable energy



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### EU legislation in place

- Directive on the promotion of biofuels: *reference target 5,75 % by 2010*
- Directive on energy taxation: *possibility* for tax exemptions
- Directive on green electricity: *reference target 21 % by 2010*

### Renewable Energy Roadmap – policy proposals presented January 2007

- 20 % of total energy consumption based on renewable energy sources – a legally binding target
- 10 % of consumption of petrol and diesel in road transport replaced by biofuels in 2020 – a legally binding target
- New European legislation on the use of renewable energy sources in heating and cooling
- National Action Plans on how to achieve the targets



## EU Policy for transport biofuels



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### Why a specific policy for biofuels?

- Dependency on oil highest in transport
- Biofuels the only direct substitute available *now* on large scale
- Fastest *increase* of CO2 emissions in transport

### Benefits from biofuels

- Security of supply – diversification on energy sources
- Reduction of CO2 emissions
- Stimulate technological development
- Rural development and employment

### Measures

- EU-wide common target
- Member States choose their mix of policy instruments
- Reporting on progress
- EU support: research, energy crops, bioenergy measures in rural development programmes



## Measures taken by EU Member States to promote biofuels



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### A range of measures :

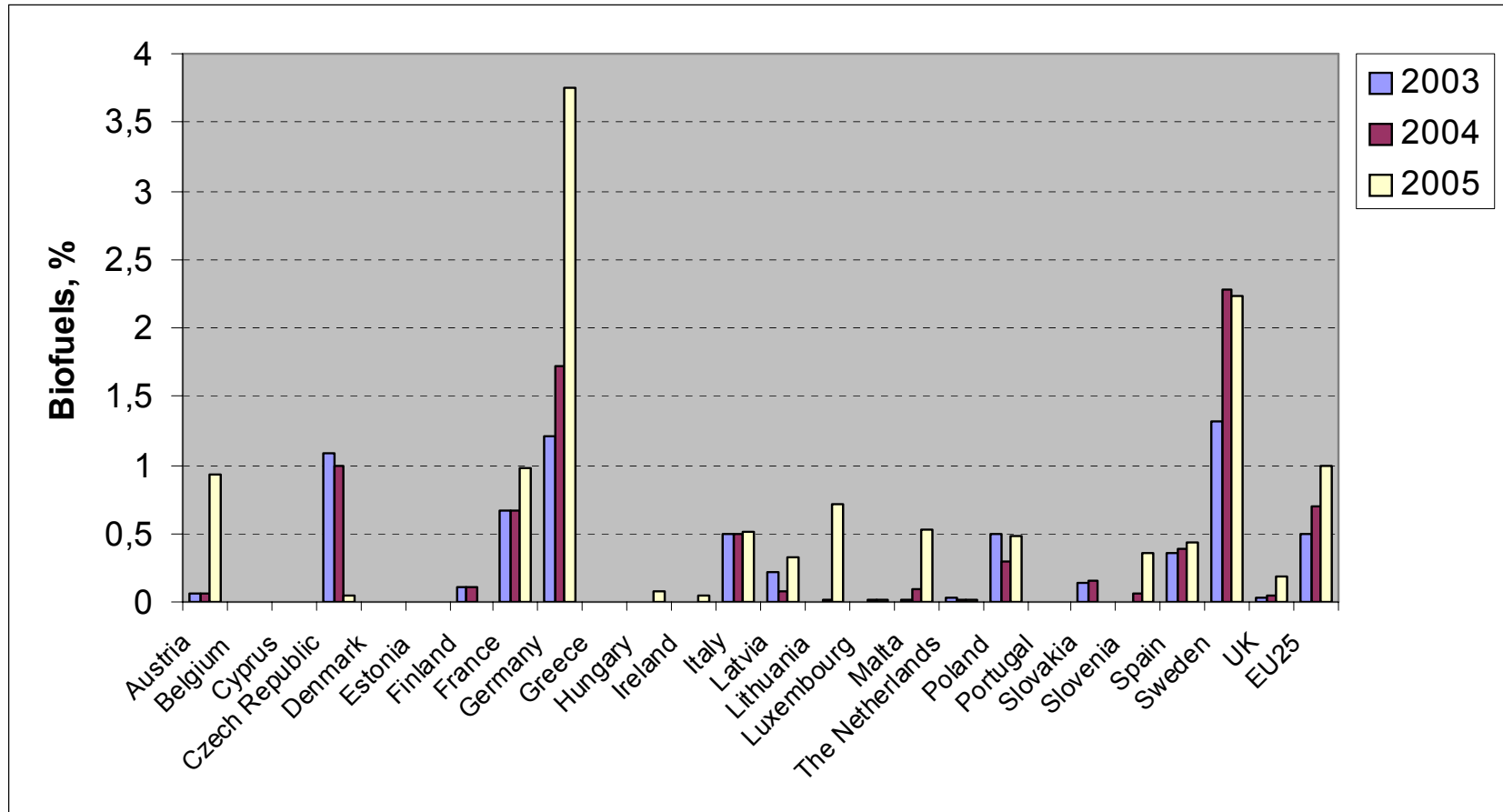
- Tax reductions or exemptions for biofuels
- Tax reductions or exemptions linked to a quota system
- Biofuels obligations for fuel suppliers or filling stations
- Subsidies for energy crop cultivation (45 €/ha EU subsidy)
- Investment support or loans for biofuel production facilities
- Standards for distribution of biofuels
- Flexi-fuel vehicles as part of green public procurement
- Demonstration projects and marketing
- Consumer incentives including free parking, no congestion charge



## Biofuels in EU Member States % of road transport fuels 2003-2005



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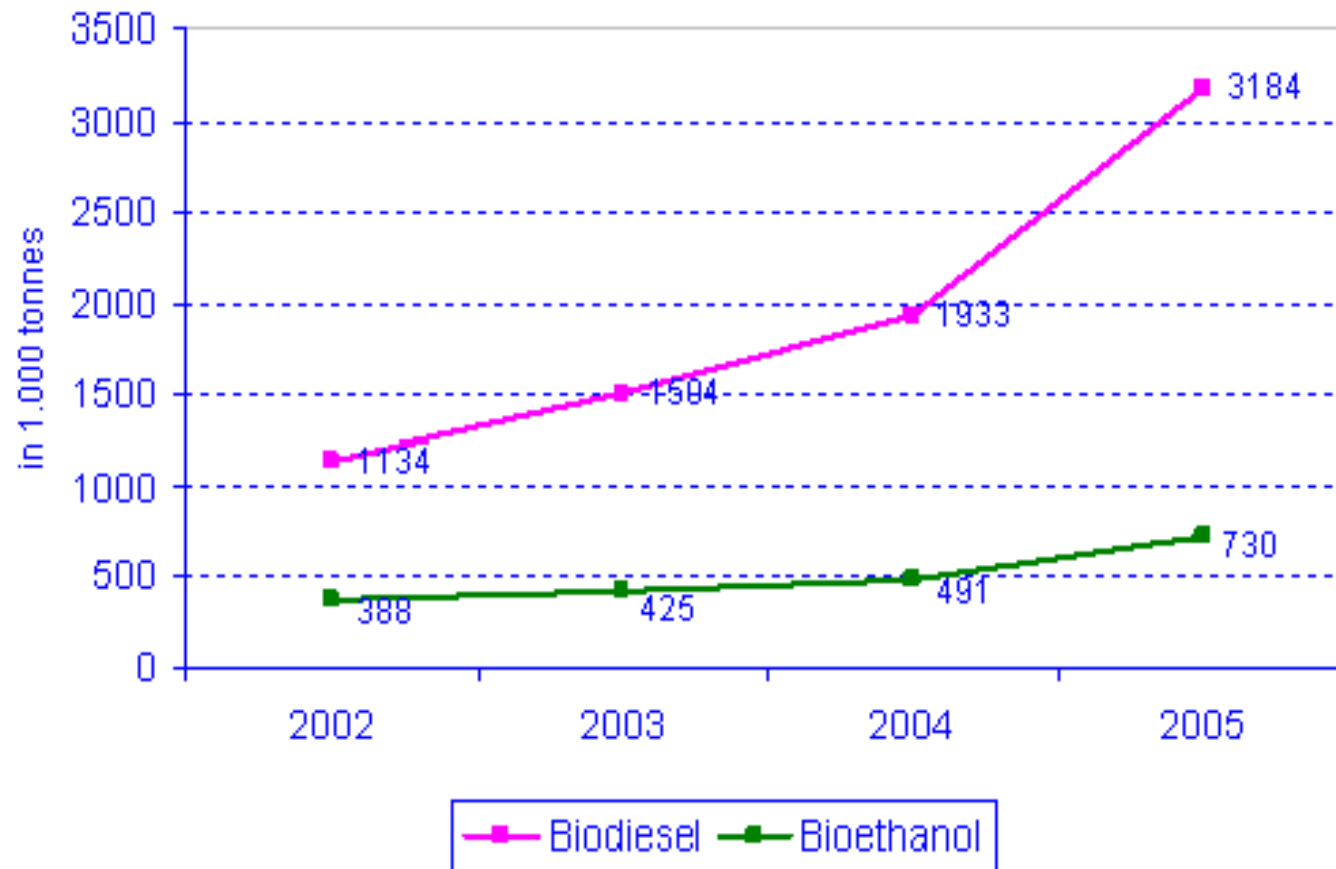




## Production of biofuels in the EU



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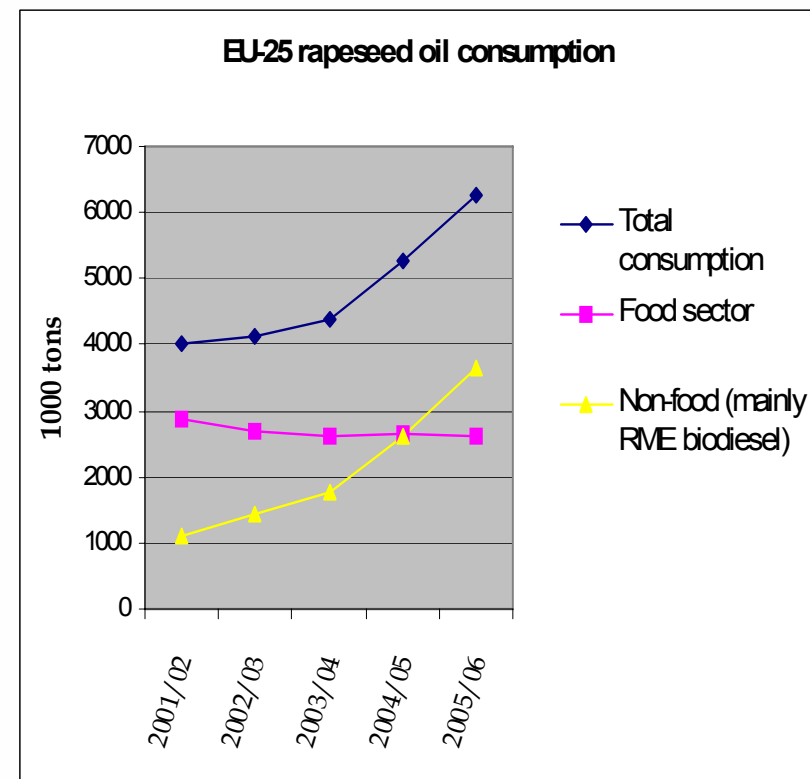
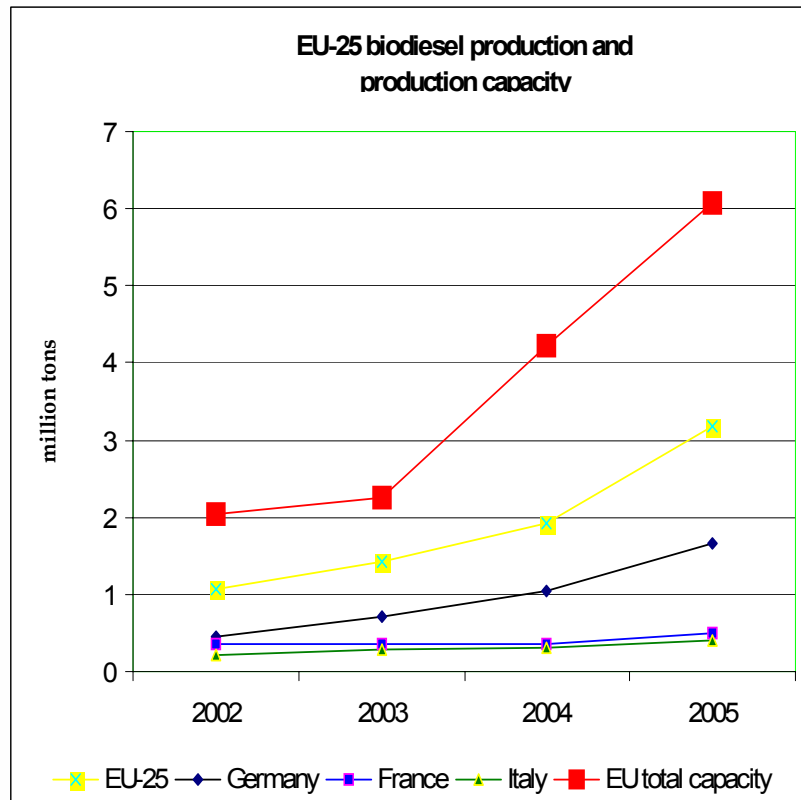


## Biodiesel production in the EU



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- 2005: biodiesel 80% of EU biofuels use
- 55 % of the car fleet runs on diesel
- Rapeseed the main feedstock



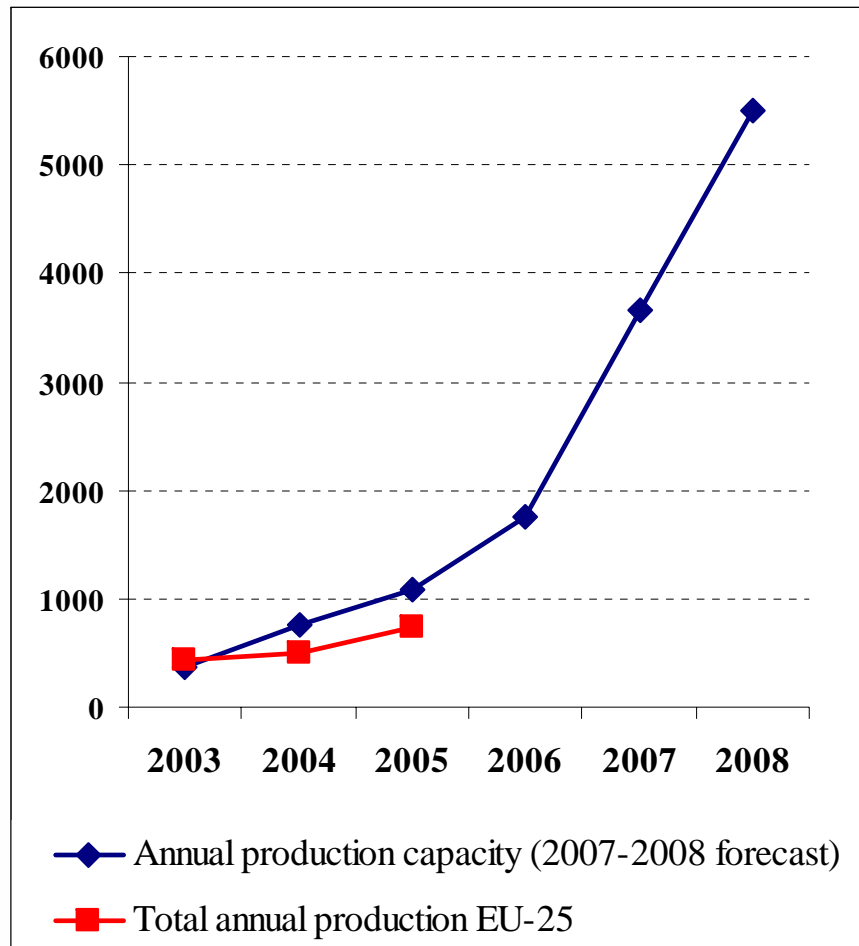




## Bioethanol production capacity in the EU



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### Number of production plants

	2004	2005	2006	2007*	2008*
EU-25	13	17	23	38-49	47-63
Spain	2	2	3	4	5
France	4	4	6	9-10	11-12
Germany	2	4	5	5-6	5-8
Sweden	2	2	2	2	2
Poland	2	2	2	4	4

\* estimates

### Average capacity utilisation rate:

2003	89%
2004	65%
2005	68%



## Feedstocks for EU biofuels



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### Bioethanol:

- EU grown cereals the main feedstock
- Limited quantities of EU grown sugar beet
- Imported ethanol produced from sugar cane
- In the future: cellulosic ethanol from straw and wastes

### Biodiesel:

- Domestically grown rapeseed the main feedstock
- Smaller quantities of imported soy and palm oil
- In the future: second generation diesel mainly from farmed wood



## Feedstocks for biofuels: current land use



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<i>(Million hectares)</i>	<b>2003 (EU-15)</b>	<b>2004 (EU-25)</b>	<b>2005 (EU-25)</b>
On <b>set-aside area</b> , of which	0,9	0,6	0,9
– Rapeseed		0,5	0,8
With <b>energy crop premium</b> , of which		0,3	0,6
– Rapeseed		0,2	0,4
<b>Without specific support</b> (estimated)	0,3	0,5	1,1-1,3
<b>Total area</b>	<b>1,2</b>	<b>1,4</b>	<b>2,6-2,8</b>

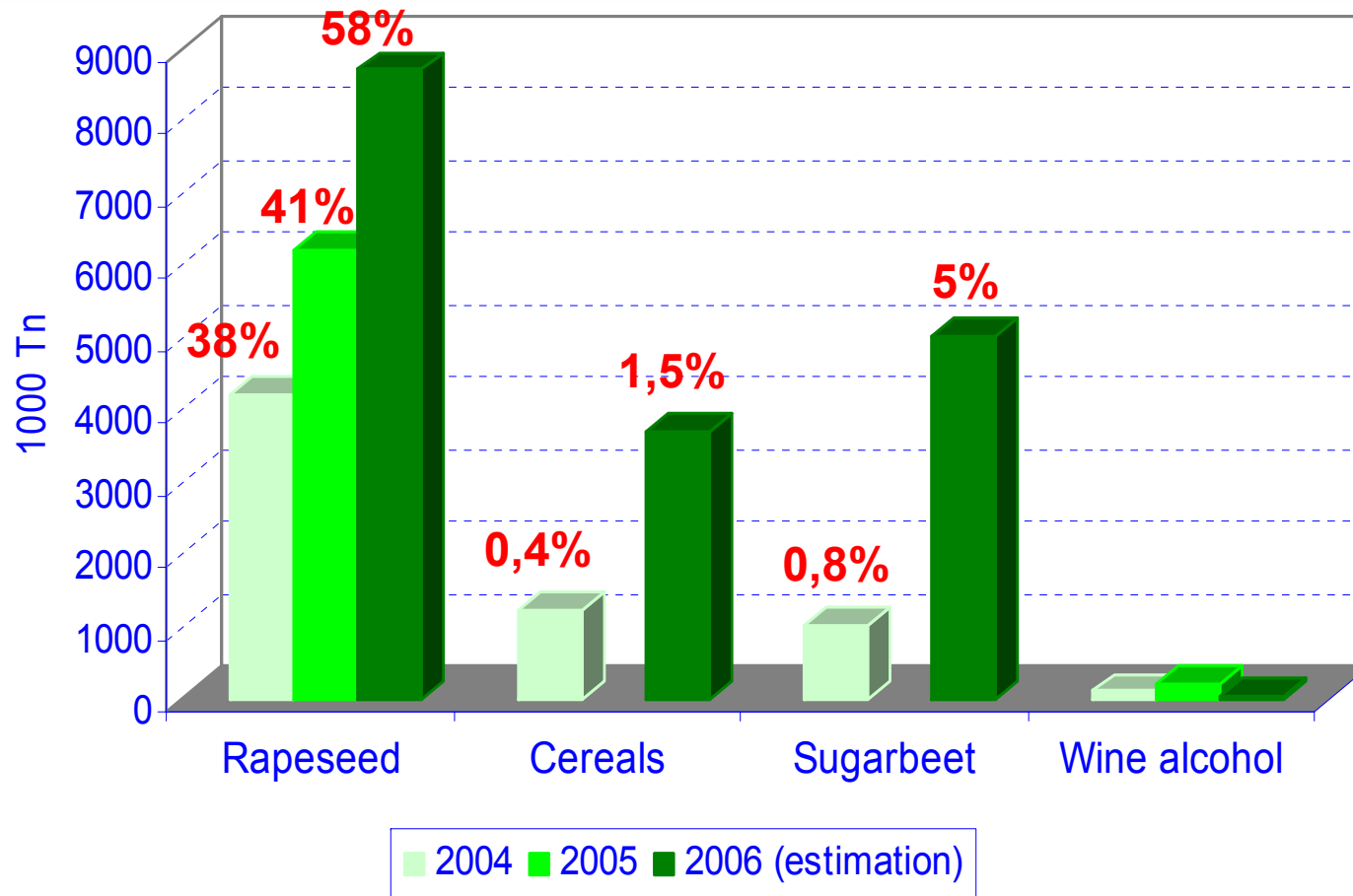
▶ **Energy crops : about 3% of the EU-25 arable area**



## Feedstocks for biofuels: share of different crops



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## 5.75% biofuel target – implications for land use in 2010



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- **If the 5.75% target reached by 2010**
  - ▶ **Biofuels production: 24 million t replacing 18.6 million t of fossil fuels**
  - ▶ **16-18 million ha of agricultural land needed**
- **Total agricultural area (EU-25): 103.6 million ha**
  - ▶ **About 18% for biofuels if all crops produced in the EU**
- **Possibilities for increasing supply:**
  - **Cereals stocks**
  - **Obligatory set-aside: about 4 million ha**
  - **Not cultivated land: 3,2 million ha**
  - **Export diversion**
  - **Productivity increases**



## 2020 scenario: Where will EU biofuels come from?



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The EU pursues a **balanced approach to domestic production and imports**

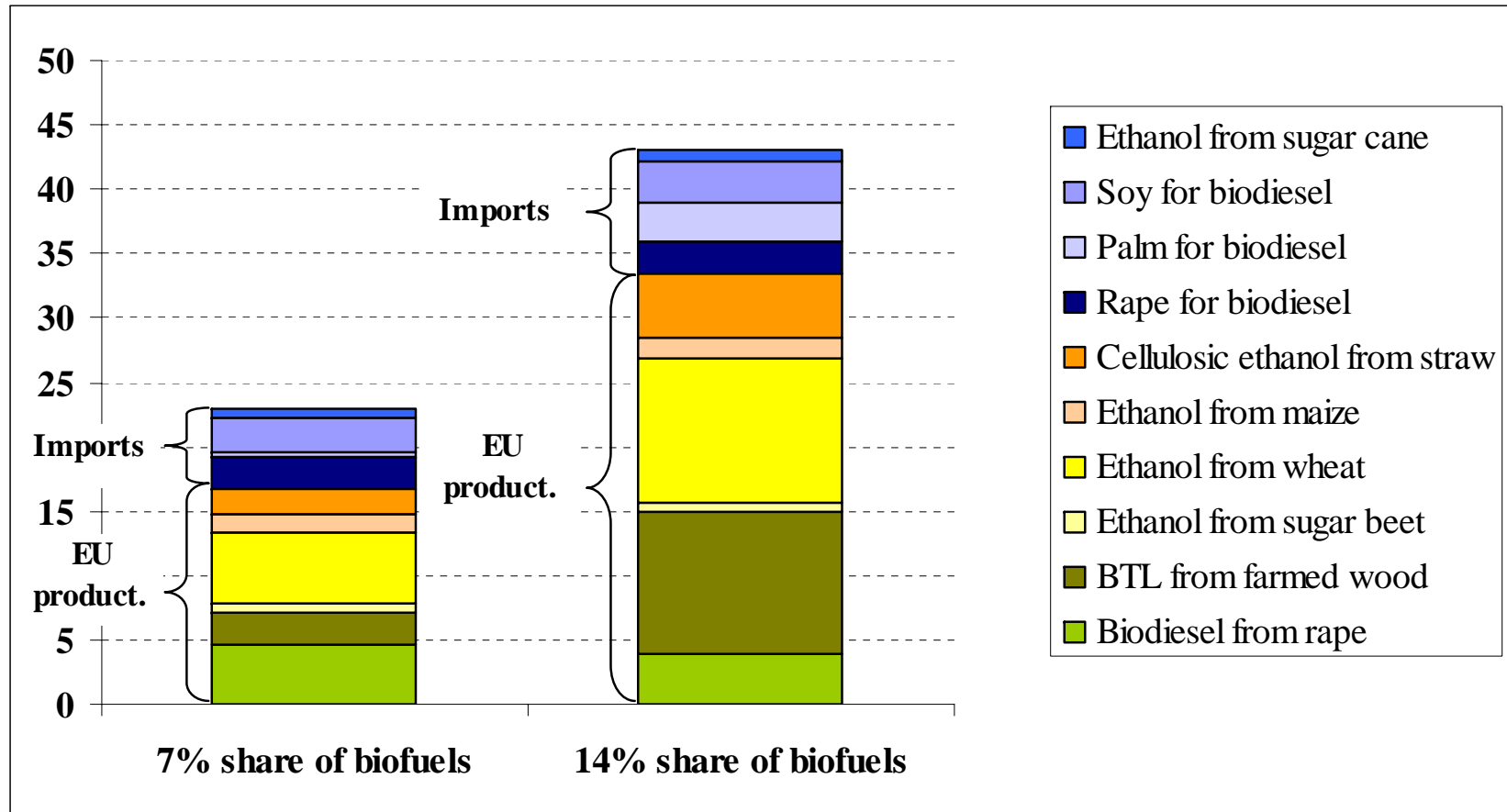
- **Overall level of imports still limited**
  - **Ethanol (ethyl alcohol, mainly from Brazil): about 6-fold increase 2001 → 2005**
  - **Biodiesel: trade very limited until now**
  
- **2020 vision (10% target):**
  - **biomass/biofuels imports likely to be an important part of EU consumption (possibly up to 30%)**
  - **significant capacity to increase ethanol production, but limited possibilities to add biodiesel production**
  - **imports of biodiesel and/or biodiesel feedstocks bound to increase with large-scale consumption**



## 2020 scenarios: mix of biofuels (Mtoe)



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## 2020 scenarios: EU-25 arable land use (million ha)



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	7% share of biofuels	14% share of biofuels
rape for biodiesel	2.7	2.6
cereals for bioethanol	4.6	8.3
sugar beet for bioethanol	0.3	0.5
farmed wood or straw (BTL)	0	6.9
<b>TOTAL LAND FOR BIOFUEL PRODUCTION</b>	<b>7.6</b>	<b>18.3</b>
non-biofuel arable production	84.8	80.8
idle arable land (set-aside)	7.7	3.4
<b>TOTAL ARABLE LAND</b>	<b>100.1</b>	<b>102.5</b>





## 2020 scenarios: Price effects of biofuel promotion



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Commodity	Average price 2006 (€/t)	Price change relative to 2006 average	
		7% scenario	14% scenario
common wheat	124	123 (-1%)	131 (+6%)
rape meal	109	69 (-37%)	63 (-42%)
rape oil	654	672 (+3%)	737 (+13%)
soy meal	170	119 (-30%)	104 (-39%)
soy oil	484	693 (+43%)	745 (+54%)
wood	No expected price effect		
oil	change relative to no biofuel	-1.5%	-3%
glycerine	No expected price effect		

Source for 2006: Oil World (for rape and soy); European Commission (for wheat)

Source for 2020: ESIM results except oil price effect estimated by Commission services on the basis of elasticities from Cooper (2003).



## EU Policy for transport biofuels



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### Challenges for biofuels policy

- Ensuring that the *field-to-wheels* environmental impact of biofuels is globally positive
- Impact on food and feed markets
- R&D to encourage development of 2<sup>nd</sup> generation biofuels
  - Diversification of feedstocks
  - Improve cost-efficiency
- Stable policy environment for the industry to develop



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Thank you for your attention