

# BIOFUELS

IN THE  
EU IMPACT  
ASSESSMENT  
2 0 2 0



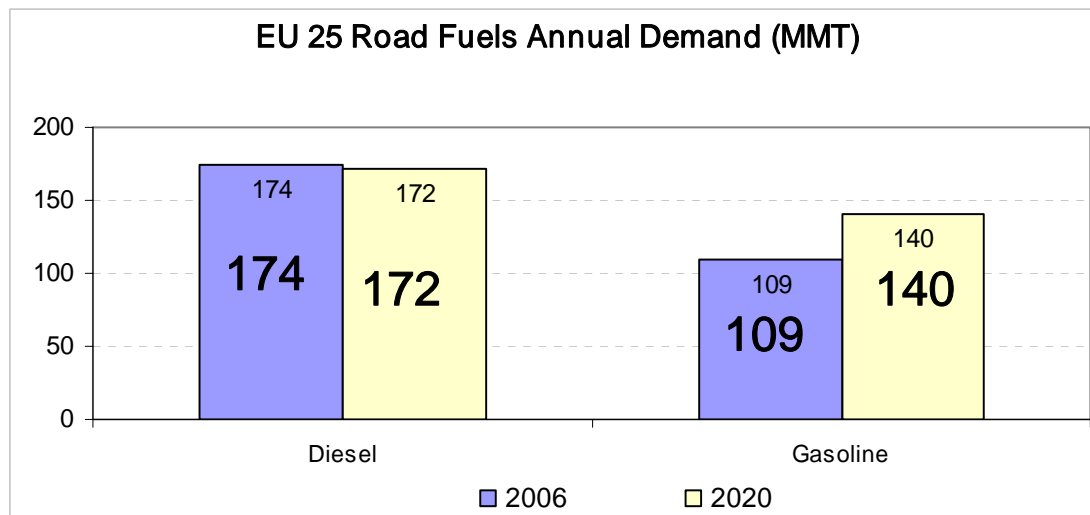
FOOD INDUSTRY  
PERSPECTIVE  
REVIEW SUMMARY

13 February 2008

Ref: 304-1179e-Anx2-REV3

# HEADLINES

- ✓ EU-27 becomes a net-importer of grains. From 10 MT exports to 32 MT of imports (Swing: 42 MT-12% of total demand).
- ✓ About 50% of the main vegetable oils will be imported in 2020 (without 2<sup>nd</sup> generation), the import per capita would be double as China's .
- ✓ Total available land in the EU can clearly not cope with the additional demand for bio-fuels. (About a quarter of total arable land available in the EU, including olive oil trees, has to be dedicated to energy crops)
- ✓ The EU is not able to produce all feedstock (grains/oilseeds) to meet the bio-fuels demand alone. A large decrease in European grains exports would be necessary and imports from other countries would be inevitable – putting pressure on arable land in other regions, especially D&E countries and potentially rainforests (Shifts the problem)
- ✓ Developments of second – generation (non-food crop based biofuels) is still at a very early stage and will possibly not contribute at a large scale to the projected demand in the future. 30% or even 20% production scenarios for 2020 are very unlikely to happen



## ROAD ENERGY DEMAND FORECAST IN THE EU



# BIOFUELS IN THE EU

## FEEDSTOCK DEMAND AT A 10% INCORPORATION OF BIOFUELS IN 2020



**Agricultural  
Feedstock  
Demand**

The mandatory 10% incorporation target over the EU would create a huge additional demand on Food agricultural commodities

**WITH 20% 2<sup>ND</sup>  
GENERATION**

- ✓ Vegetable Oils demand for Biodiesel would be 15.7 Million MT
- ✓ Grains demand for Bioethanol would be 56 Million MT

**WITHOUT 20% 2<sup>ND</sup>  
GENERATION**

- ✓ Vegetable Oils demand for Biodiesel would be 19.7 Million MT
- ✓ Grains demand for Bioethanol would be 70 Million MT

# SUPPLY & DEMAND BALANCE VEG.OILS

	2006 situation	2020 - 10% achieved	
		share of 20% of 2nd gen.	Without 2nd gen.
Diesel consumption (Mio t)	174	171.6	172
Biodiesel demand (Mio t)	6	15.7	19.6
Food & Others Demand	20.5	20.5	20.5
Total Demand	26.5	36.2	40.2
EU Production Oils	16.6	22.7	22.7
Total Imports Oils and fats	9.9	13.6	17.5

<u>Of which Rapeseed Oil:</u>			
Biodiesel demand (Mio t)	4.8	10.2	12.8
EU Production (Optimistic due to acreage shift)	6.4	11.8	11.8
Biodiesel demand as %age of EU production	74%	87%	108%
Residual left to meet food demand	1.6	1.6	-1.0
Food Demand	3	3	3
Imports	-1.4	-1.4	-4.0
Volume at risk (Availability of acreages, 2 Mn Ha)	0	-3	-3
Volume at risk (Availability of set-aside land, 1 Mn Ha)	0	-1.5	-1.5
Imports	-1.4	-5.9	-8.5

Blend assumption for bio-diesel is 65% share of rapeseed oil

28.6 Million Tons of seeds

# SUPPLY & DEMAND BALANCE GRAINS

Millions of MT	2006 situation	2020 - 10% acheived	
		share of 20% of 2nd gen.	Without 2nd gen.
Gasoline consumption (Mio t)	109	140	140
Ethanol demand (Mio t)	1.2	18.0	22.5
<b><u>Grains demand:</u></b>			
Ethanol	2.4	<b>56.5</b>	<b>70.6</b>
Food & Others	98.9	109.2	109.2
Feed Demand	165.6	167.5	167.5
<b>Total Grain Demand</b>	<b>266.9</b>	<b>333.1</b>	<b>347.2</b>
EU Production Grains	277.71	315.80	315.80
<b>Net Balance (Exports-Imports)</b>	<b>9.99</b>	<b>-18.12</b>	<b>-32.23</b>
<b>Total net balance swing</b>		<b>-28.11</b>	<b>-42.22</b>

12% of total demand

Note: Negative numbers means Imports

# AREA REQUIRED FOR BIOFUELS IN THE EU

## SET- ASIDE LAND FIGURES IN EU

Set-Aside Land (MHa)	7.0
(Of which) Suitable for Cultivation	3.7
Already in Use for Energy Crops	(-) 0.8
<b>Available for Cultivation</b>	<b>2.9</b>
Allocated: 70% to grains and 30% to oilseeds	

← ONLY

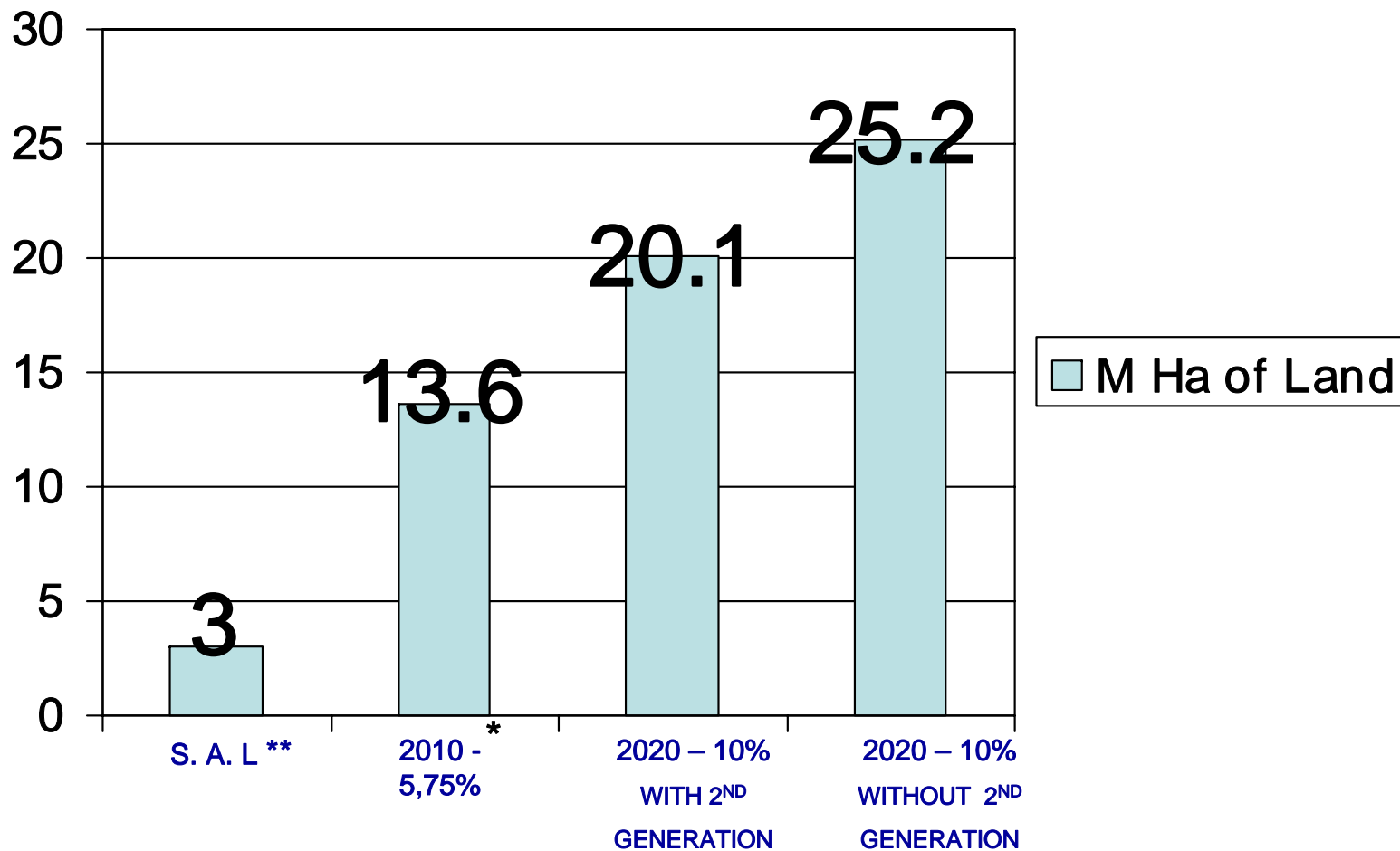


<i>CURRENT LAND USE FOR BIOFUELS</i>		<i>LAND REQUIRED AT A 10% BIOFUELS INCORPORATION IN 2020</i>	
2006 SITUATION		WITH 20% 2 <sup>ND</sup> GENERATION	WITHOUT 20% 2 <sup>ND</sup> GENERATION
Nrs are in Millions of hectares			
Oilseeds	3.21	8.78	10.97
Grains	0.53	10.79	13.49
Beet	0.02	0.56	0.70
<b>T o t a l [in MHa]</b>	<b>3.76</b>	<b>20.13</b>	<b>25.16</b>
<b>% CHANGE</b>		<b>+ 435%</b>	<b>+570%</b>

**THERE IS NOT ENOUGH LAND TO COPE WITH THE REQUIREMENTS !**

# AREA REQUIRED FOR BIOFUELS IN THE EU

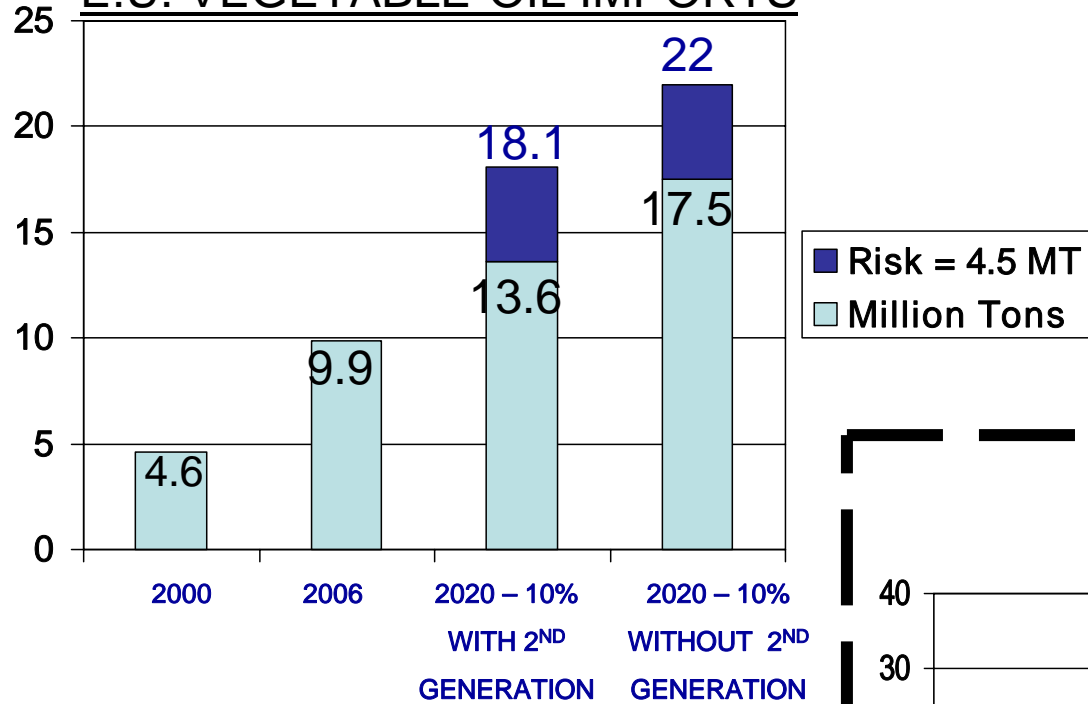
AREA REQUIRED FOR BIOFUELS IN THE E.U.



\* Source: AWI Study    \*\* Net Available Agriculture land

# PARADIGM SHIFT

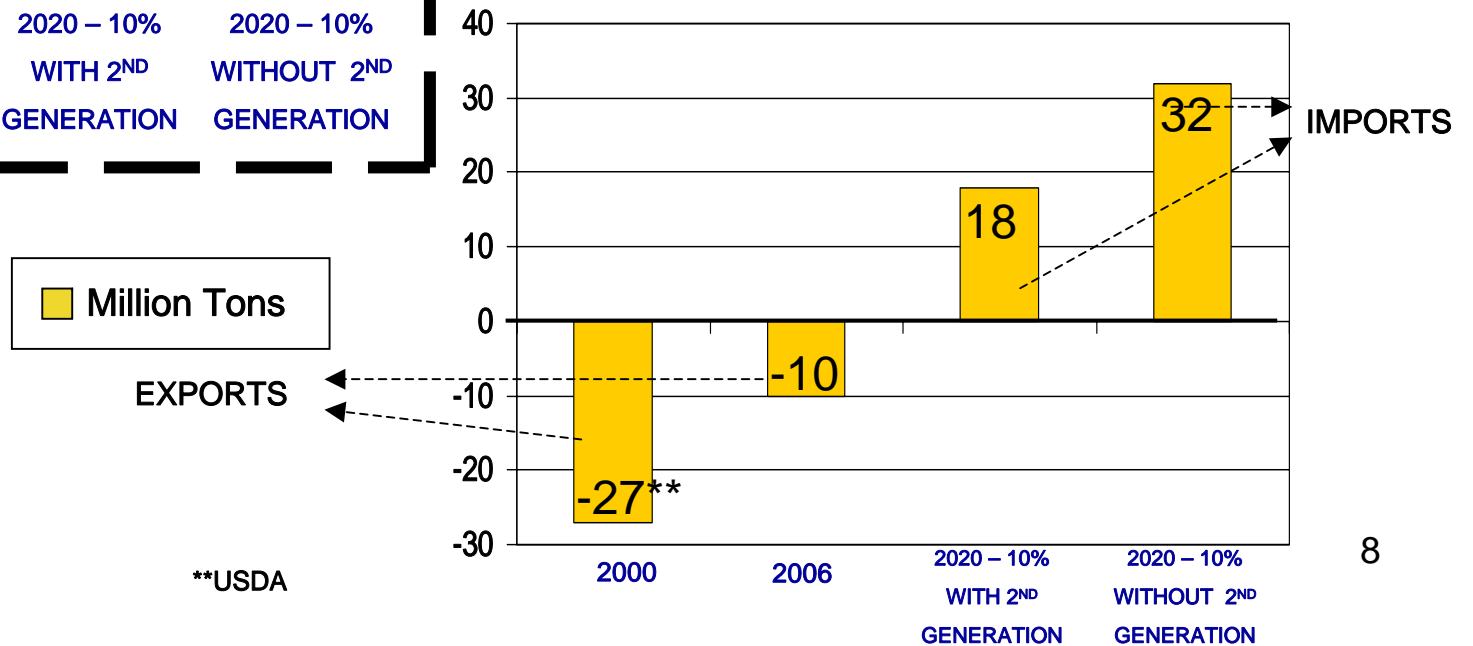
E.U. VEGETABLE-OIL IMPORTS \*



Assumption:

Risk on S.A.L = 1 M Ha + 2 M Ha from other crops (not grains)

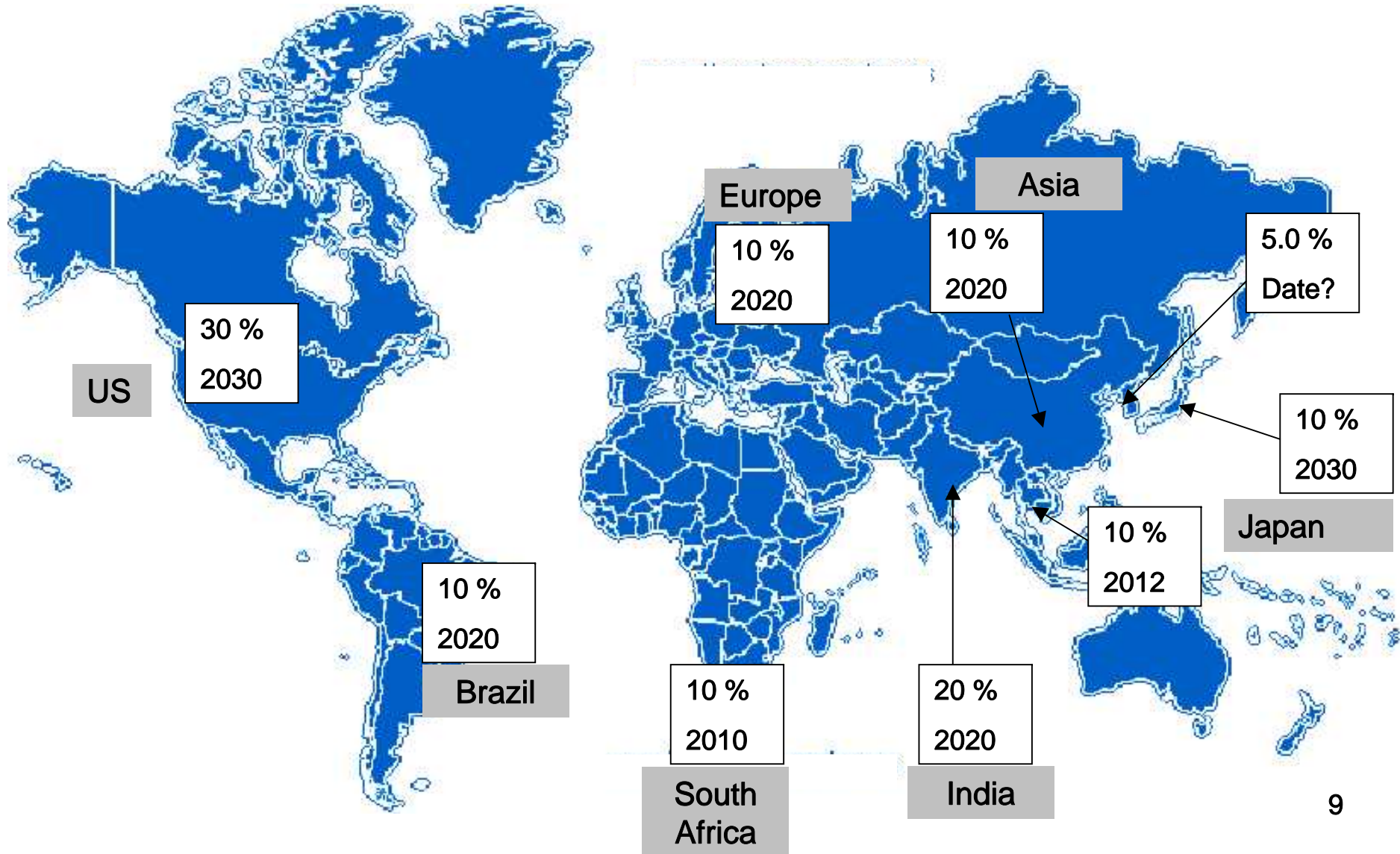
E.U. GRAIN IMPORTS



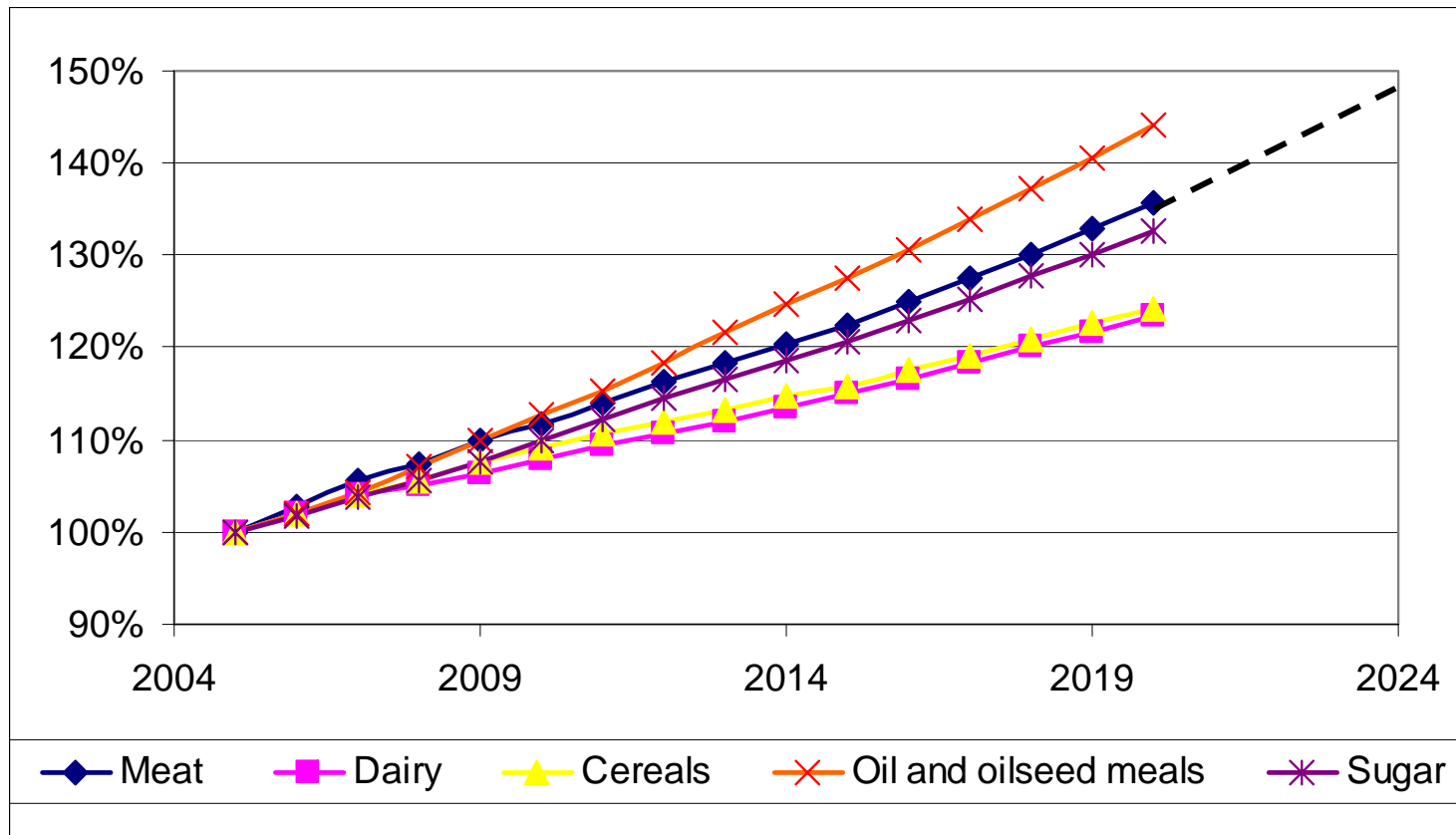
\* 17 OILS & FATS

\*\*USDA

# TARGETS FOR BIO-FUELS WORLDWIDE



# In the next 20 years it will be necessary to produce 50% more food



Source: OECD / FAO 2006

- Without agricultural intensification this will require an additional 2.5 billion ha of land (e.g. 2/3 of the current forest area!)

# FURTHER CONSEQUENCES

## *All the required arable land – expansions will generate:*

- Additional Co2 emissions from deforestation, land use change and increased use of fertilizers
- Additional pressure on water-resources for increased agriculture activity. Biofuels are extremely water-intensive- e.g. - It takes 1500 to 4500 liters of water to produce 1 liter of bioethanol
- Additional biodiversity problems and potential extinction of animal species on tropical areas

- *The additional huge demand on food-crops will contribute to worsen the “agflation” –(Inflation caused by agriculture products)*
- *The price of staple food in Third World countries will increase leading to an aggravation on world- hunger and mal-nutrition*



# ASSUMPTIONS :

- Road Energy demand numbers were taken from Concawe's Well To Tank Report, version 2006.
- Food & other demand constant throughout the period (Optimistic assumption as food demand for new EU members is likely to grow).
- Rapeseed: Based on 06/07 and 07/08 yield (2.7 MT of seeds per Ha) yield increase calculates with 33% in 2020 – Roughly about 2.5% a year – Up to 3.6 MT seed per Ha. Calculation: Yield increase per year = 0.75% based on 3.2 MT / ha
- Available Set-aside Land is 3 M Ha. (2 M Ha to grains and 1 M Ha to rapeseed). Additionally 2 M Ha allocated to rapeseed crops from other areas / crops.
- Rapeseeds in 2020 assumed with 28.6 MT (Based on above's assumptions).
- 2006 numbers on acreage, yields & production are 2005/06 (Oct/Sep) from Oilworld database June 2007.
- Second generation share calculated at 20% (Alternatively, zero)
- Grains: Yield growth assumptions as per FAPRI
- Food and other demand assumed to be constant over the period

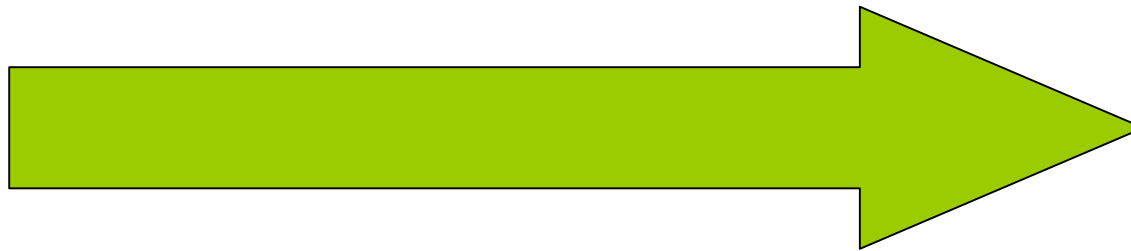
## ➤ RISKS:

- Increase in total area under cultivation for grains and oilseeds is at 5 Million of Ha as against 3 Million of Ha available from set-aside. Rapeseed got additional 2 Millions of Ha. For rapeseed oil this means a supply risk of 4.5 MT.

# SOURCES

- Well to wheels analysis of future automotive and powertrains in the European context - Version 2006
- Oil World material & Oil World Database June 2007 / LMC
- FAPRI
- FAO
- Paul Hodson - DG Energy and transport
- FO Licht – April 25<sup>th</sup> 2007

# BACKUP SLIDES



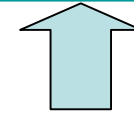
# EU COMMISSION FIGURES COMPARISON

	Commission Impact assessment Mar 07		CAOBISCO using FEDIOL Energy Demand Numbers	
	MTOE	MMT	MTOE	MMT
Biofuel usage at 10% incorporation	34.6		31.2	
Biodiesel	19	21.7	17.2	19.7
Bioethanol	15.6	25.0	14	22.4
Biofuel Demand of Oils & Grains				
Veg Oils		21.7		19.7
Grains				70
Biofuel Demand of Oils & Grains with 2-G				
Veg Oils		15.2		15.7
Grains		59.0		56.0
Growth in production from 2006 to 2020				
Cereals		38		38
Oils				6
Additional Acreages required				
Cereals		12.9		10.79
Oils		8.5		8.78
Imports Required				
Cereals				18.12
Oils				13.56

\* Probably commission is talking with 30% share of 2-G biofuels

# TRADE CHANGES IN THE EU

IMPORT INCREASES TO FILL THE GAPS !



- To meet the 10% incorporation target for biofuels in the EU in 2020 the EU, as there is not enough additional land available, the gap would have to be met through an increase in the level of imports from other countries :



→ *The EU would have to increase its imports of oils from the 2006 level of 9.9 Millions of MT to 13.6 Millions of MT in 2020, considering an increase in the production levels and 20% use of 2<sup>nd</sup> Generation Biofuels. In case of no 2<sup>nd</sup> Generation used in 2020, the EU would have to import 17.5 Millions of MT of oils to cope with the demand generated by the 10% target.*

FROM NET - EXPORTER TO NET - IMPORTER !



→ *The EU would pass from being a Net-Exporter of grains from the 2006 level of 10 Millions of MT to a Net-Importer of 18.12 Millions of MT in 2020, considering an increase in the production levels and 20% use of 2<sup>nd</sup> Generation Biofuels. In case of no 2<sup>nd</sup> Generation used in 2020, the EU would have to import 32.23 Millions of MT of grains to cope with the demand generated by the 10% target.*