



Impacts of the EU bio-fuel policy on the farm sector: A CGE assessment

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Bio-fuel in the EU: a complex topic

- Energy security/price
- Climate change
- Environment
- Trade balance
- Trade policy
- Public budget
- Competition policy
- Farm income/policy

The EU bio-fuel policy

- 2003 Directive sets a target for consumption
 - Member states implement it (tax exemptions/surcharge ; obligations)
- Common Agricultural Policy
 - Set aside and energy crop direct payments
- Assessment
 - Only one macro economic study by the EC (crude assumptions on imports/animal/labour)

Our modelling framework

- CGE model for EU15
- Simulation of CAP/WTO scenarios
- Flexible representation of economic behaviour
- Fine coverage of farm and food processing sectors

Farm products

Sector	Agricultural sub-sectors	AGRICULTURE
Agriculture	Soft wheat	Soft wheat
	Barley	Barley
	Maize	Maize
	Rape	Rape
	Sunflower	Sunflower
	Soya	Soybean
	Protein crops	Protein crops
	Sugar beet	A&B Sugar beet, C sugar beet
	Fodder	Fodder on arable land
	Grass	Grass
	Poultry	Poultry, Organic nitrogen, Organic phosphate, Organic potassium
	Pigs	Pigs, Organic nitrogen, Organic phosphate, Organic potassium
	Laying hen	Eggs, Poultry, Organic nitrogen, Organic phosphate, Organic potassium
	Dairy cows	Bovine cattle, Raw milk, Calves, Dairy cows, Organic nitrogen, Organic phosphate, Organic potassium
	Suckling cows	Bovine cattle, Calves, Suckling cows, Organic nitrogen, Organic phosphate, Organic potassium
	Beef calf	Beef calf, Organic nitrogen, Organic phosphate, Organic potassium
	Calf rearing	Bovine cattle, Heifers, Bulls and Steers, Organic nitrogen, Organic phosphate, Organic potassium
	Heifers	Bovine cattle, Dairy cows, Suckling cows, Organic nitrogen, Organic phosphate, Organic potassium
	Bulls and Steers	Bovine cattle, Organic nitrogen, Organic phosphate, Organic potassium
	Sheep and goats	Sheep and goat milk, sheep and goat animals
Fruit vegetables	Fruits, potatoes and vegetables	
Other agricultural activities	Other agricultural products	

Food and other products

FOOD PROCESSING	
Meat industry	Bovine meat, Pig meat, Poultry meat, Veal, sheep and goat meats, Carcass meals, Animal fats
Dairy industry	Butter, Skimmed milk powder, Cheese from cow, cheeses from sheep and goat, Whole milk powder, fluid milk, Other dairy products
Compound feed industry	Compound feed
Cereal processing industry	Grains bran, Corn gluten feed, iso-glucose, Other cereal processed products, bio-ethanol
Oilseed crushing industry	Rape oil, Sunflower oil, Soybean oil, Rape cake, Sunflower cake, Soybean cake, palm oil
Sugar industry	A&B Sugar, C sugar, Sugar beet pulp, Molasses
AGRICULTURAL STATIONERIES	
Mono product sectors supplying:	Mineral nitrogen, Mineral phosphate, Mineral potassium, pesticides, veterinary products, fish meals, other energy rich feed, other protein rich feed, other feed ingredients, seeds
OTHER SECTORS	
Food retail trade	Food retail trade services
Other sectors	Other products and services

Baseline assumptions

- Productivity
- Household preferences
- Macro-economic conditions
- World market conditions
- Supply of primary factors
- No new CAP, no new WTO agreement
- No Biofuel

Definition of experiment

- EC estimate of fuel consumption
- 8 Millions tons of Rape oil
- 7.3 Millions tons of Bio ethanol (from sugar beet or soft wheat)
- Specific duty on bio ethanol
- Set aside / Blair House agreement

Impacts on the oilseed products

	Rape oil	Rape meal	Soya oil	Soya meal	Palm oil
Production	3357 68.9%	2955 68.8%	2180 -0.1%	5647 -0.1%	-
Total demand	2485 31.0%	4478 23.4%	2021 8.4%	26671 3.4%	3631 -6.2%
Net exports	905 -58.4%	-62 -306.2%	125 -117.5%	-18001 5.3%	-3631 -6.2%
Domestic prices	483 47.9%	110 -12.4%	462 33.9%	175 -4.3%	454 38.9%
World prices	570 47.9%	129 -12.4%	546 33.9%	207 -4.3%	548 38.9%

Impacts on cereals, oilseeds and sugar

	Soft wheat	Corn	Rapeseed	Sunflower	Sugar beet/ Sugar
Area (Millions ha)	13569 4.5%	3934 -2.9%	2131 76.2%	1534 29.2%	1554 13.4%
Yields per ha (t/ha)	6.9 0.9%	9.3 0.4%	3.4 0.4%	1.5 -0.4%	59.8 -0.4%
Production (Millions T)	93545 5.4%	36640 -2.5%	7207 76.6%	2324 28.6%	13877 13.0%
Total demand (Millions T)	76833 19.5%	38941 -2.0%	8400 68.9%	4854 13.2%	13095 14.0%
Net exports (Millions T)	17413 -58.2%	-2500 5.0%	-469 0%	-2115 0%	430 -7.4%
Domestic prices (€T)	107 11.3%	132 6.4%	204 42.6%	219 34.2%	404 0.0%
World prices (€T)	128 11.3%	96 0.6%	245 42.6%	263 34.2%	281 0.1%

Production costs of bio-ethanol

	Quantity (mt)	Domestic Price (€T)
Ethanol from domestic wheat	6300	592
Ethanol from domestic sugar beet	1000	608
Imported ethanol	0	628
Domestic demand	7300	594

Impacts on livestock sectors

	Pork	Poultry meat	Beef	Butter	Compound feed
Production (Millions T)	19150 0.5%	8888 0.6%	6507 0.9%	1846 0.0%	121032 0.8%
Total demand (Millions T)	18273 0.2%	8728 0.0%	6821 0.1%	1905 1.9%	121032 0.8%
Net exports (Millions T)	841 6.9%	128 6.8%	-307 -12.5%	342 -6.0%	-
Domestic prices (€T)	2648 -1.2%	2823 -1.2%	2811 -0.4%	2462 0.0%	287 0.7%
World prices (\$T)	3177 -1.2%	3864 -0.7%	1927 -0.9%	1701 2.7%	-

Sensitivity analysis

- Availability of land
- Price elasticity of farm supply
- Fossil oil price

Efficiency in terms of farm support

- Public expenditure: 10.5 b€
- Leakage to foreign producers: 4.8 b€
- Leakage to food industry: 2.5 b€
- Farm incomes: 3.2 b€
 - Land and quota rents: 1.0 b€
 - Capital rewards: 0.7 b€
 - Labour rewards: 1.5 b€
 - Farm job creation : 42000 Units