Sustainable Biofuels Criteria in the EU Renewables Directive: some issues relevant for African biofuels development

COMPETE project meeting

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Key elements of the proposed EU Renewables Directive related to biofuels

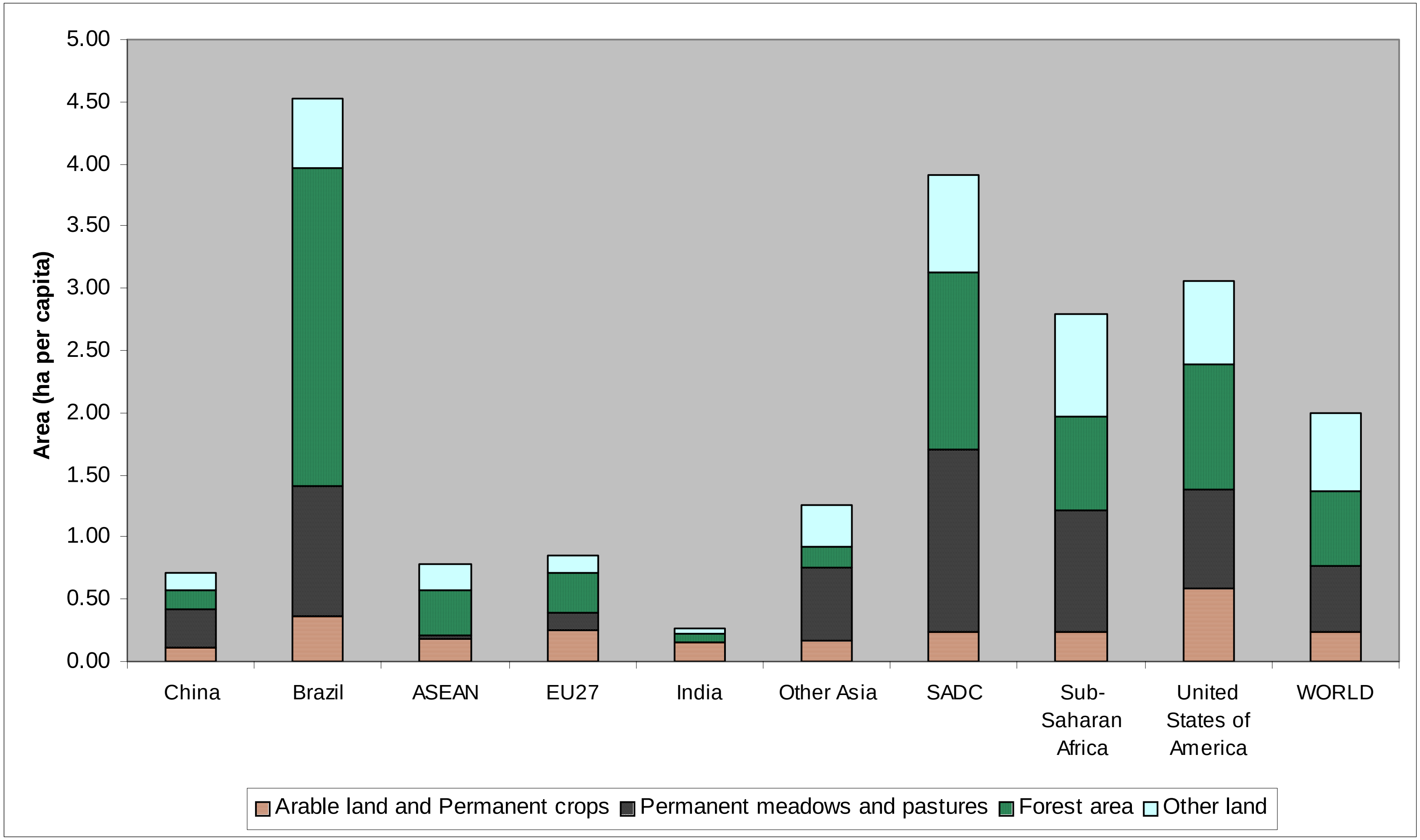
- Binding 10% share of **renewable fuels** for transport
- Biofuels must meet **sustainability criteria** in order to qualify under the 10% share
- Minimum GHG reduction – 35% proposed by EC
- Establishes "no-go" areas: undisturbed forests, nature reserves, bio-diverse grasslands, wetlands
- Requirements at filling stations – availability, labelling
- Biofuels from wastes or ligno-cellulosics to count 2x
- Methodology Equation + Default values for GHG emissions
- Interest from several Parliamentarians to add provisions/incentives for biofuels from "degraded" lands

What share of biofuels will EU import in the future vs. EU production? – realising domestic EU potential requires 2nd generation

		1st generation only				*2nd generation*			
		EU15+	**EU12**	**Ukraine**	**Total**	**EU15+**	**EU12**	**Ukraine**	**Total**
ARABLE land	Baseline	1.5	2.1	2.3	5.9	2.3	3.2	3.4	8.9
	Low	1.3	2.1	2.3	5.7	2.0	3.2	3.4	8.6
	High	1.8	2.5	2.6	6.9	2.8	3.8	3.8	10.4
PASTURE	Baseline	Not used				Not used			
	High	Not used				1.3	1.0	0.8	3.1
TOTAL	High	1.8	2.5	2.6	6.9	4.1	4.8	4.6	13.5

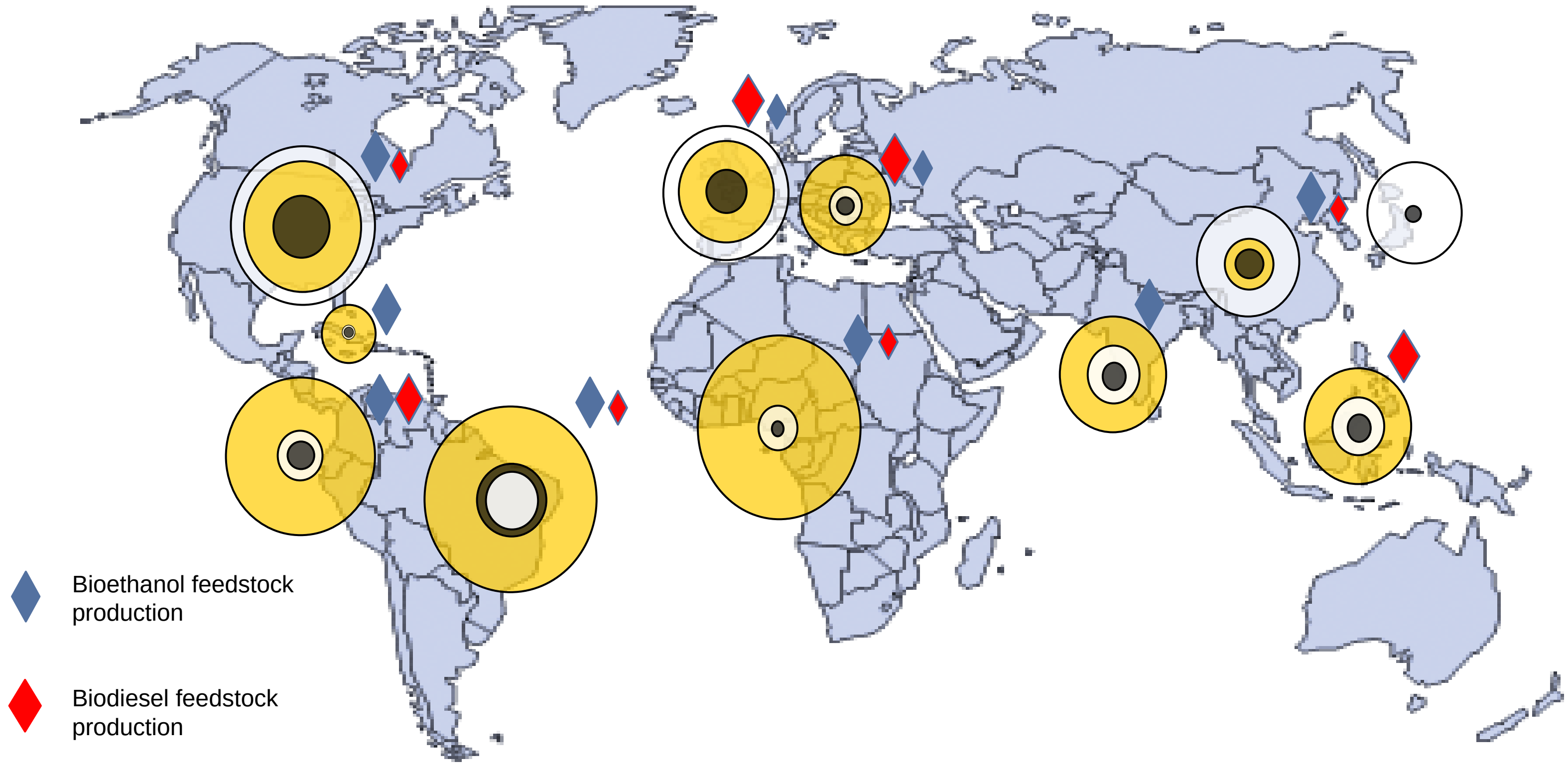
Source: Fischer et al, 2007

Land area per capita by type and major countries or regions



Source: FAOSTAT, 2008

Biofuels Supply and Demand Markets



Note: Theoretical demand represents ~10% of 2004 liquid transport fuel consumption to be achieved by 2015. Brazil demand is 40%. Diamonds represent the ratio between the type of fuel feedstock produced. Feedstock potential represents total land which could be devoted to first generation feedstocks. Current capacity represents biofuels production capacity in place at year end 2006.

Source: New Energy Finance

Current Methodology Equation for calculating GHG emissions for biofuels

$E = e_{ec} + e_l + e_p + e_{td} + e_u – e_{ccs} - e_{ccr} – e_{ee}$,

where:

E = total emissions from the use of the fuel;

e_{ec} = emissions from the extraction or cultivation of raw materials;

e_l = annualised emissions from carbon stock changes caused by land use change;

e_p = emissions from processing;

e_{td} = emissions from transport and distribution;

e_u = emissions from the fuel in use;

e_{ccs} = emission savings from carbon capture and sequestration;

e_{ccr} = emission savings from carbon capture and replacement; and

e_{ee} = emission savings from excess electricity from cogeneration.

Risk-adder approach for indirect land use change (proposed by Öko-Institute (Fritsche et al 2008)

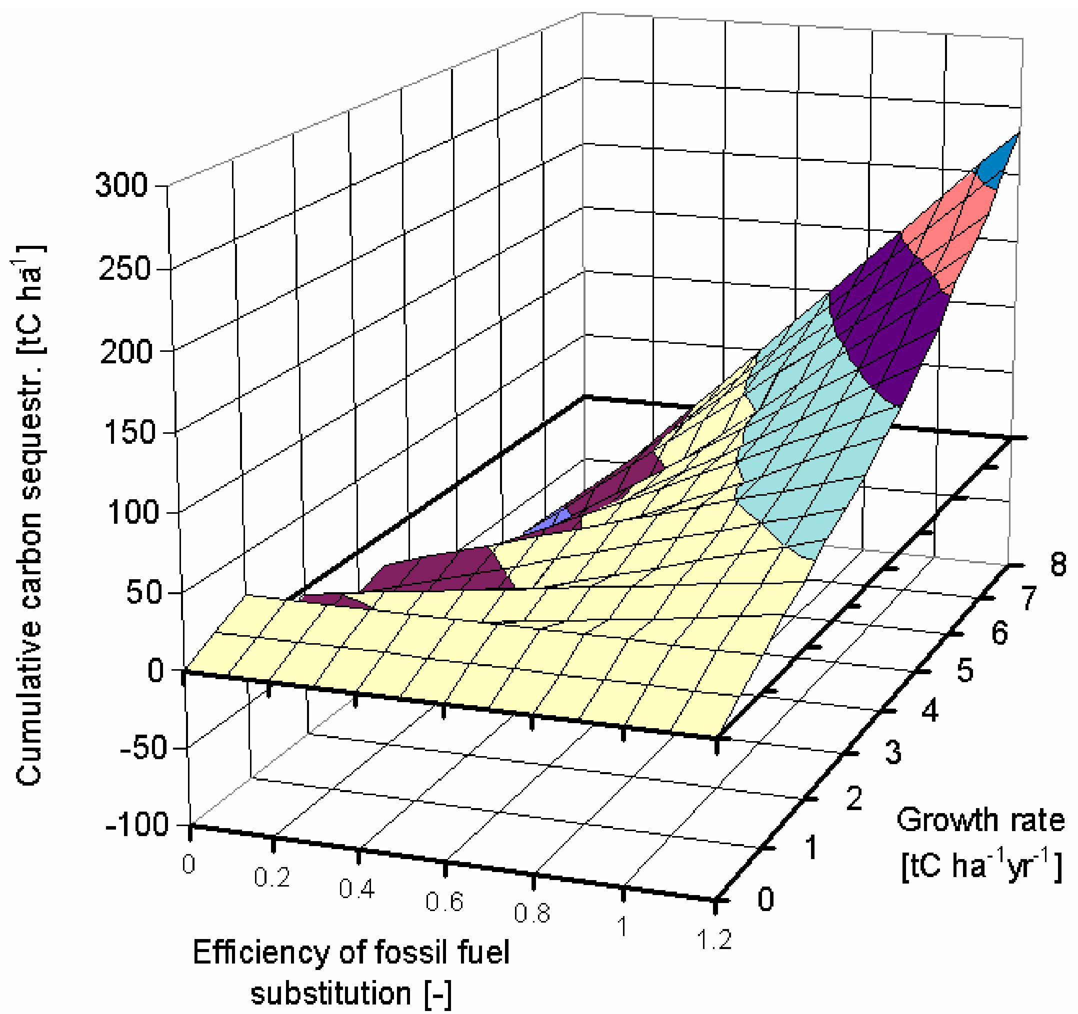
	kg CO_{2eq}/GJ with a risk adder level:			relative to fossil diesel/gasoline		
biofuel route, life-cycle	**max**	**med**	**min**	**max**	**med**	**min**
Rapeseed to RME, EU	117	89	60	**38%**	**4%**	-30%
palmoil to PME, Indonesia, rain forest	180	142	103	**112%**	**67%**	**21%**
palmoil to PME, Brazil, tropical	199	154	110	**135%**	**82%**	**29%**
sugarcane to EtOH, Brazil, tropical	60	48	37	-30%	-43%	-56%
maize to EtOH, USA	89	73	57	5%	-14%	-33%
maize to EtOH, EU	69	60	50	-19%	-30%	-41%
SRC/SG to BtL, EU	52	37	23	-39%	-56%	-73%
SRC/SG to BtL, Brazil, tropical	59	42	25	-30%	-50%	-70%
SRC/SG to BtL, Brazil, steppe	73	52	30	-14%	-39%	-64%

bold red = **no** GHG reduction!

NOTE: includes **only** above-ground carbon

Eucalyptus plantation in Brazil

Difference between Managing forests for bioenergy production vs. managing for carbon storage (Schlamadinger et al 2007)



Estimated levels of land degradation by major region

	None	Light	Moderate	Severe	Very Severe	Total degradation: Light-Very Severe	Degradation: Moderate – Very Severe
Sub-Saharan Africa	33	24	18	15	10	65	42
North Africa and Near East	30	17	19	28	7	70	52
Asia and Pacific	28	12	32	22	7	72	61
North Asia east of Urals	53	14	12	17	4	47	33
South and Central America	23	27	23	22	5	77	50
Europe	9	21	22	36	12	90	70
North America	51	16	16	16	0	44	29
World	35	18	21	20	6	65	47

Source: UNEP, 1992

Degree of soil degradation by sub continental regions (% of total area). Adopted from World Atlas of Desertification (UNEP, 1992b)

	None	**Light**	**Moderate**	**Strong**	**Extreme**
Africa	83	6	6	4	0.2
Asia	82	7	5	3	<0.1
Australasia	88	11	0.5	0.2	<0.1
Europe	77	6	15	1	0.3
North America	93	1	5	1	0
South America	86	6	6	1	0
World					
Percentage	85	6	7	2	<0.1
Area (‘000km″)	110483	7490	9106	2956	92

What lessons/issues for biofuels development in Africa?

- Large potential market provides a major opportunity
- Meeting GHG criteria will generally not be a problem
- Land availability is there, but grasslands may be issue
- Degraded lands - given low cost of land in general for foreign investors, few incentives to use it
- Co-products allocation should be developed
- lower energy intensity of agriculture in Africa is advantage
- Measurement, monitoring, compliance are the key issues for African producers – missing from Directive

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