

**Contribution of Energy Crops
in
Displacing Fossil Fuels in the EU**

**Michael Doran
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Why Energy Crops?

- Primary energy demand
- Security of supply
- Social policy
- Regional policy

Current Agricultural Production

- Total area in EU27
- Agricultural area in EU27
- Arable land in EU27
- % of total area
- Ha of agricultural land per capita

Table 1 – Data of total area of biomass production

	Total area (106Ha)	Agricultural area (106Ha)	Arable land (106Ha)(% of total area)		Hectares of agricultural land per capita
Austria	8.4	3.4	1.4	17	0.42
Belgium	3.1	1.4	0.8	27	0.13
Bulgaria	11.1	5.3	3.3	30	0.68
Cyprus	0.9	0.1	0.1	11	0.18
Czech Republic	7.9	4.3	3.1	39	0.42
Denmark	4.3	2.7	2.3	53	0.49
Estonia	4.5	0.8	0.5	12	0.63
Finland	33.8	2.2	2.2	7	0.43
France	55.2	29.7	18.5	33	0.49
Germany	35.7	17.0	11.8	33	0.21
Greece	13.2	8.4	2.7	20	0.77
Hungary	9.3	5.9	4.6	50	0.6
Ireland	7.0	4.4	1.2	17	1.09

	Total area (106Ha)	Agricultural area (106Ha)	Arable land (106Ha)(% of total area)		Hectares of agricultural land per capital
Italy	30.1	15.1	8.0	26	0.26
Latvia	6.5	2.5	1.8	28	1.08
Lithuania	6.5	3.5	2.9	45	1.02
Luxemburg	0.3	0.1	0.06	24	0.28
Malta	0.03	0.01	0.01	31	0.03
Netherlands	4.2	1.9	0.9	22	0.12
Poland	31.3	16.2	12.6	40	0.42
Portugal	9.2	3.7	1.6	17	0.37
Romania	23.8	14.7	9.4	39	0.66
Slovakia	4.9	2.4	1.4	29	0.45
Slovenia	2.0	0.5	0.2	9	0.26
Spain	50.5	30.2	13.7	27	0.73
Sweden	45.0	3.2	2.7	6	0.36
U.K.	24.4	17.0	5.7	23	0.28
EU-27	433.1	196.6	113.5	26	0.41

Renewable Energy Consumption in the EU

- Existing energy consumption
- Consumption of renewables
- Consumption of biomass, including forestry
- % of renewable energy and biomass

Table 2 – Gross Inland Consumption for RES

	Gross inland consumption Mtoe	Renewables	Biomass	Share of RES of GIC (%)	Share of Biomass related to GIC (%)
		Mtoe	Mtoe		
Austria	32.7	6.77	3.45	20.7	10.55
Belgium	54.8	1.16	1.12	2.11	2.04
Bulgaria	-	-	-	-	-
Cyprus	2.5	0.09	0.005	3.6	0.2
Czech Republic	43.6	1.36	1.19	3.12	2.72
Denmark	20	2.93	2.37	14.6	11.85
Estonia	5.6	0.61	0.60	10.89	10.7
Finland	37.7	8.80	7.49	23.34	19.86
France	273.7	17.30	11.92	6.32	4.35
Germany	347.7	13.76	9.37	3.95	2.69
Greece	30.6	1.56	0.95	5.09	3.1
Hungary	26.2	0.97	0.86	3.7	3.28
Ireland	15.7	0.32	0.21	2.03	1.33

	Gross inland consumption Mtoe	Renewables	Biomass	Share of RES of GIC (%)	Share of Biomass related to GIC (%)
		Mtoe	Mtoe		
Italy	184.8	12.53	3.79	6.78	2.05
Latvia	4.6	1.65	1.37	35.86	29.78
Lithuania	9.2	0.73	0.69	7.93	7.5
Luxemburg	4.7	0.07	0.05	1.48	1.06
Malta	0.9	-	-	-	-
Netherlands	82.3	2.36	2.17	2.86	2.63
Poland	92.5	4.32	4.12	4.67	4.45
Portugal	26.2	3.89	2.87	14.84	10.95
Romania	-	-	-	-	-
Slovak Rep.	18.6	0.74	0.38	3.97	2.04
Slovenia	7.1	0.82	0.47	11.54	6.61
Spain	140.2	8.98	4.85	6.4	3.45
Sweden	53.1	14.13	8.88	26.61	16.72
U.K.	232.1	3.67	3.05	1.58	1.31
EU25**	1747.2	109.53	72.274	6.26	4.13
** Data from Romania & Bulgaria missing					

Table 3 - Energy Crop Potential in EU-27, depending on percentage of utilised arable land and achieved crop yield

Yield	10% arable land in EU-27		20% arable land in EU-27		30% arable land in EU-27	
	PJ	Mtoe	PJ	Mtoe	PJ	Mtoe
10t TS/ha	2,042 PJ	46Mtoe	4,084 PJ	91Mtoe	6,127 PJ	137Mtoe
20t TS/ha	4,084 PJ	91Mtoe	8,169 PJ	182Mtoe	12,253 PJ	274Mtoe
30t TS/ha	6,127 PJ	137Mtoe	12,253 PJ	274Mtoe	18,380 PJ	410Mtoe

Energy Crop Potential

- Reduction in waste
- Improvement in genotypes
- Increased area
- Genetically modified crops

Food v Energy Crops

- Price of staple food products rising
- Bioethanol production in US and Brazil
- EU targets for consumption of liquid biofuels
- Consider sustainability and biodiversity
- Consumption vs production targets

Table 4 - Area under energy crops in the EU 25* (kha)

	Total	Energy crop scheme	Non food on set aside regime	Without spec. regime
Austria	19.63	7.91	9.37	2.36
Belgium	7.56	2.59	4.07	0.91
Bulgaria	-	-	-	-
Cyprus	-	-	-	-
Czech Republic	104.0	0.0	0.0	104.0
Denmark	47.90	17.34	24.81	5.75
Estonia	-	-	-	-
Finland	9.44	8.31	0.00	1.13
France	572.61	135.40	376.2	1.00
Germany	1356.61	235.60	341.00	780.00
Greece	-	-	-	-
Hungary	18.50	18.50	0.0	0.0
Ireland	2.36	1.61	0.47	0.28
Italy	9.80	0.29	8.34	1.18

	Total	Energy crop scheme	Non food on set aside regime	Without spec. regime
Latvia	-	-	-	-
Lithuania	-	-	-	-
Luxemburg	-	-	-	-
Malta	-	-	-	-
Poland	60.2	3.67	0.0	56.53
Portugal	0.09	0.08	0.00	0.01
Romania	-	-	-	-
Slovak Republic	-	-	-	-
Slovenia	1.59	0.14	1.45	0.0
Spain	39.45	25.61	9.11	4.73
Sweden	37.45	29.34	3.61	4.49
The Netherlands	1.29	0.05	1.09	0.15
U.K.	191.17	88.59	79.58	23.0
EU 27	2479.66	575.03	859.10	1045.53

Conclusion

- By 2030 possible for EU27 to meet 20% energy demand from biomass
- Would require increase in energy crop production of 800%
- Achievable if land for energy crops increases by a factor of 3 and increase in yield by plant breeding