

Climate and environmental pollution caused by important energy crops

Plant, fruit	Raw material	Process or use	Product	Nitrogen requirement, (cause of greenhouse gas N ₂ O)	Use of herbicides, fungicides, pesticides
Beet, potato, grain, corn	Plant material containing sugar and starch	Fermentation into ethanol	Fuel, ("bioethanol", fuel additive)	High	High
Sugar cane	Plant material containing sugar and starch	Fermentation into ethanol	Fuel, ("bioethanol", fuel additive)	High	Low
Rapeseed, sunflower seeds	Plant material containing oil	Pressing, extraction, transesterification	Fuel, ("biodiesel", fuel additive)	High	High
Oil palms	Plant material containing oil	Pressing, extraction, transesterification	Fuel, ("biodiesel", fuel additive)	Medium	High
Jatropha	Plant material containing oil	Pressing, extraction, transesterification	Fuel, ("biodiesel", fuel additive)	Medium	Low
Straw	Wood chips	Combustion	Heat and possibly electricity	None	None
Miscanthus (Chinese silver grass, elephant grass)	Wood chips	Combustion	Heat and possibly electricity	Low	Low
Hemp	Wood chips	Combustion	Heat and possibly electricity	Low	Low
Trees, bushes	Logs, wood chips, pellets	Combustion	Heat and possibly electricity	Low	Low
Grass clippings, plant waste	Chopped pieces	Anaerobic fermentation into methane ("biogas")	Electricity and heat (combustion in gas turbines, engines)	Low	Low
Corn, grain, beet	Chopped pieces	Anaerobic fermentation into methane ("biogas")	Electricity and heat (combustion in gas turbines, engines)	High	High

Sources for this table: Schlipf et al; Handbuch der Landwirtschaft {Farming Manual}; website of the training and research stations at the University of Bonn; website of the Bayerische Landesanstalt für Wald und Forstwirtschaft [Bavarian State Institute of Forestry]; FAO databases (Food and Agriculture Organization of the United Nations).