

Conversion technologies platforms are classified according to decomposition process, and engineering specifications.

Appropriate feedstocks correspond to each conversion technology.

Resulting products correspond to each conversion technology.

		1. Biomass Conversion Technology	2. Feedstocks	3. Products				
Thermochemical	Gasification	Fixed Bed	Any Organic Material Examples: Agricultural wastes, hazardous organic wastes, industrial wastes. Pretreatment: Waste typically segregated. Qualifications: Dry MSW is favorable. Coal size distribution must be controlled to ensure good bed permeability. Final Conversion Technology (Optional): Fischer-Tropsch Catalytic Conversion	Intermediate Products: Combustible gases, liquids, tars, and inert fluidizing gases. Final Products: Electricity, Thermal Energy, Hydrogen, Ethanol and other alcohols, Diesel type fuels, Gasoline. Co-products: Charcoal, Ash, Carbon Dioxide.				
		Fluidized Bed						
		Novel Design						
	Pyrolysis	Fast Pyrolysis	Any Organic Material Pretreatment: Sorting Qualifications: None	Intermediate products: Syngas and Charcoal Final Products: Bio-Oil and Charcoal Co-products: Electricity and Thermal Energy				
		Slow Pyrolysis						
Biochemical	Ethanol Production	Wet-Mill Fermentation	Grains Mostly: Corn Pretreatment: Separation of the oil, protein, fiber and the bulk of the nutrients from the starch	Intermediate Products: Mash, Sugar Final Products: Ethanol Co-products: Distillers grains plus solubles, Carbon Dioxide				
		Dry-Mill Fermentation						
		Lignocellulosic Biomass Fermentation						
	Anaerobic Digesters	Mesophilic Process or Thermophilic Process	Anaerobic activated sludge process Anaerobic clarigester Anaerobic contact process Anaerobic expanded-bed reactor Anaerobic filter Anaerobic fluidized bed Anaerobic lagoon Anaerobic migrating blanket reactor Batch system anaerobic digester Expanded granular sludge bed digestion Hybrid reactor Imhoff tank One-stage anaerobic digester Submerged media anaerobic reactor Two-stage anaerobic digester Upflow anaerobic sludge blanket digestion Upflow and down-flow anaerobic attached growth	Almost any organic material: paper, grass clippings, leftover food, seewages, animal wastes; and other forms of biomass such as distillers grains. Pretreatment: Sorting or screening to remove inorganic material. Qualifications: The material may need to be pre-processed and water added.	Intermediate products: N/A. Final Products: Biogas, Thermal Energy, Digestate. Co-products: Liquid and Solid Biofertilizers.			
			Landfill			Bioreactor vessel	Organic Wastes Pretreatment: Sorting pre-treatment Qualifications: The waste must be contained, compacted and covered in a vessel.	Intermediate products: Biogas composed of Methane, Carbon Dioxide, Nitrogen, Hydrogen, Hydrogen Sulfide and Oxygen. Final Products: Electricity, thermal energy, methane, CNG or LNG for vehicle fuel. Co-products: Carbon Dioxide for possible use in greenhouse operations, and Biofertilizers.
						Landfill Site		
	Aerobic	Static Pile Enclosed Compost Turned Window In-Vessel Compost Transesterification	Practically any Organic Waste Pretreatment: Sorting Qualifications: A separation between organic and contaminants is necessary.	Intermediate products: None Final Products: Valuable Compost Co-products: Heat and Carbon Dioxide. (May be useful in a greenhouse environment or for heating)				
					Chemical	Biodiesel Production	Oils, fats, used cooking oils, greases, methanol or ethanol and a catalyst Pretreatment: Used cooking oils, yellow greases, and some tree oils are taken through an esterification process to remove fatty acid that should, preferably, be reduced to less than 1% (at least below 4%). Qualifications: Essentially any bio-oil, animal fat or tallow, used cooking oil, yellow/trap grease, plant or tree oil can be converted into biodiesel if the fatty acid content is low enough.	Intermediate Products: Oils fats or greases taken through transesterification Final Products: Biodiesel Co-products: Glycerin, Soaps

Figure 5. Biomass Conversion Matrix
(See Appendix C. for enlargement of this matrix.)