Table 2: Summary of Available Energy in Ohio Counties (in Billions Btu's)

Regions	Counties	Crop Residues	Wood Wastes	MSW [1]	Livestock Manure	Total	% of Total	Rank
Central	Delaware	671.4	100.2	-	21.2	792.8	0.29	63
	Fairfield	909.6	360.7	2,724.9	23.9	4,019.1	1.48	18
	Franklin	282.0	1,241.4	8,038.6	5.5	9,567.6	3.52	6
	Licking	735.0	200.6	250.5	30.9	1,217.0	0.45	51
	Madison	1,396.7	15.1	-	22.5	1,434.3	0.53	44
	Pickaway	1,479.6	283.8	-	36.0	1,799.4	0.66	36
	Union	918.7	63.1	-	47.6	1,029.5	0.38	61
	Total Central	**6,393.0**	**2,265.0**	**11,014.0**	**187.7**	**19,859.6**	**7.31**	**5**
Eastern	Belmont	-	216.2	-	7.1	223.3	0.08	82
	Carroll	21.2	111.5	-	8.8	141.5	0.05	84
	Coshocton	278.1	1,641.1	9,929.5	44.3	11,893.0	4.38	5
	Guernsey	25.3	362.9	-	9.9	398.2	0.15	75
	Harrison	-	85.4	-	4.8	90.2	0.03	87
	Holmes	178.0	593.9	382.8	63.9	1,218.5	0.45	52
	Jefferson	12.4	110.8	-	4.6	127.8	0.05	85
	Monroe	8.7	29.9	-	5.1	43.6	0.02	88
	Tuscarawas	101.2	962.0	3,047.9	29.1	4,140.2	1.52	16
	Total Eastern	**625**	**4,113.6**	**13,360.2**	**177.6**	**18,276.3**	**6.73**	**6**
Northern	Erie	440.3	166.6	982.0	6.9	1,595.9	0.59	40
	Huron	1,126.7	37.9	-	26.5	1,191.2	0.44	56
	Lorain	303.0	950.9	8,299.1	18.3	9,571.4	3.52	7
	Lucas	474.4	333.5	1,793.5	14.8	2,616.2	0.96	22
	Ottawa	400.4	486.2	4,602.2	6.2	5,495.1	2.02	12
	Sandusky	1,101.4	71.3	-	15.3	1,188.1	0.44	57
	Seneca	1,565.4	118.9	888.7	42.6	2,615.7	0.96	25
	Wood	2,050.1	613.4	5,472.8	11.6	8,148.0	3.00	9
	Total Northern	**7,462**	**2,778.8**	**22,038.4**	**142.4**	**32,421.5**	**11.94**	**4**
Northcentral	Ashland	430.9	60.1	-	38.1	529.1	0.19	68
	Crawford	1,367.3	94.7	595.7	63.0	2,120.7	0.78	33
	Hardin	1,299.1	12.5	-	64.0	1,375.5	0.51	45
	Knox	578.3	66.0	-	33.3	677.6	0.25	67
	Marion	1,101.2	22.5	-	35.8	1,159.5	0.43	58
	Morrow	694.5	15.8	-	23.2	733.5	0.27	64
	Richland	417.5	475.7	3,604.5	28.8	4,526.4	1.67	14
	Wayne	633.1	392.5	1,197.5	109.0	2,332.1	0.86	28
	Wyandot	1,146.2	272.7	2,595.1	59.3	4,073.4	1.50	17
	Total Northcentral	**7,668.0**	**1,412.6**	**7,992.8**	**454.5**	**17,527.8**	**6.45**	**8**

Regions	Counties	Crop Residues	Wood Wastes	MSW[1]	Livestock Manure	Total	% of Total	Rank
North eastern	Ashtabula	161.0	689.0	4,809.7	15.9	5,675.6	2.09	11
	Columbiana	216.0	53.1	-	25.3	294.4	0.11	76
	Cuyahoga	-	611.0	1,682.1	-	2,293.1	0.84	24
	Geauga	14.6	270.4	-	6.8	291.9	0.11	77
	Lake	-	347.8	1,836.8	-	2,184.5	0.80	30
	Mahoning	140.6	2,052.7	18,160.6	12.0	20,366.0	7.50	3
	Medina	120.1	249.2	-	10.4	379.7	0.14	74
	Portage	91.6	134.4	-	7.3	233.4	0.09	80
	Stark	302.3	2,594.6	22,871.4	26.2	25,794.6	9.50	2
	Summit	-	458.0	1,714.9	0.3	2,173.1	0.80	29
	Trumbull	195.7	407.8	645.9	8.6	1,257.9	0.46	48
	Total Northeast	**1,242**	**7,868.0**	**51,721.3**	**112.8**	**60,944.1**	**22.44**	**1**
North western	Allen	1,064.9	80.1	-	46.7	1,191.8	0.44	55
	Defiance	886.6	240.3	2,104.4	17.0	3,248.2	1.20	19
	Fulton	1,484.0	14.4	-	85.2	1,583.6	0.58	41
	Hancock	1,641.6	136.5	884.6	37.7	2,700.4	0.99	23
	Henry	1,698.6	35.1	193.2	16.2	1,943.1	0.72	35
	Paulding	1,187.3	60.5	527.8	14.0	1,789.7	0.66	37
	Putnam	1,688.9	10.8	-	79.4	1,779.1	0.66	38
	Van Wert	1,446.7	9.3	-	20.4	1,476.4	0.54	43
	Williams	821.2	187.5	1,414.6	23.3	2,446.6	0.90	27
	Total Northwest	**11,920**	**774.5**	**5,124.5**	**339.9**	**18,158.9**	6.69	**7**
Southern	Adams	131.7	157.7	-	19.5	308.9	0.11	78
	Gallia	18.2	2,706.6	23,510.1	7.2	26,242.1	9.66	1
	Highland	607.8	90.7	-	15.8	714.3	0.26	66
	Jackson	7.7	581.1	1,984.3	2.0	2,575.0	0.95	26
	Lawrence	-	86.7	-	1.2	87.9	0.03	86
	Pike	12.4	598.6	2,308.2	3.2	2,922.5	1.08	20
	Ross	857.0	1,233.2	-	13.5	2,103.7	0.77	34
	Scioto	50.2	789.2	-	1.9	841.3	0.31	62
	Total South	**1,685**	**6,243.7**	**27,802.7**	**64.3**	**35,795.7**	**13.18**	**3**
South eastern	Athens	15.1	350.8	1,288.0	3.1	1,657.0	0.61	39
	Hocking	0.1	521.8	-	0.7	522.6	0.19	69
	Meigs	7.7	252.8	-	3.2	263.7	0.10	81
	Morgan	14.4	139.9	-	11.0	165.3	0.06	83
	Muskingum	176.2	203.5	-	22.2	402.0	0.15	73
	Noble	-	291.6	-	2.2	293.8	0.11	79
	Perry	245.6	834.6	5,865.5	8.3	6,954.1	2.56	10
	Vinton	2.7	452.5	-	0.6	455.8	0.17	71
	Washington	74.8	376.8	-	14.8	466.4	0.17	70
	Total Southeastern	**537**	**3,424.3**	**7,153.5**	**66.1**	**11,180.5**	**4.12**	**10**

Regions	Counties	Crop Residues	Wood Wastes	MSW[1]	Livestock Manure	Total	% of Total	Rank
South western	Brown	272.6	209.1	1,632.9	8.6	2,123.2	0.78	32
	Butler	411.7	197.9	-	20.5	630.1	0.23	65
	Clermont	100.7	454.2	3,734.0	2.4	4,291.3	1.58	15
	Clinton	1,126.3	47.0	112.0	31.6	1,316.8	0.48	46
	Fayette	1,282.8	9.5	-	25.5	1,317.9	0.49	47
	Greene	896.2	173.3	-	27.4	1,096.9	0.40	60
	Hamilton	-	2,069.8	17,790.7	0.5	19,861.0	7.31	4
	Montgomery	486.7	955.9	7,671.2	16.0	9,129.8	3.36	8
	Preble	1,134.0	54.8	286.9	68.8	1,544.5	0.57	42
	Warren	293.1	97.7	-	7.3	398.2	0.15	72
	Total South western	**6,004**	4,269.2	**31,228**	**208.7**	41,709.6	15.36	**2**
Western	Auglaize	1,063.8	86.3	-	64.0	1,214.0	0.45	54
	Champaign	1,205.7	15.1	-	31.6	1,252.5	0.46	50
	Clark	997.6	90.6	-	17.6	1,105.8	0.41	59
	Darke	2,010.1	28.6	-	178.4	2,217.1	0.82	31
	Logan	983.3	425.7	3,163.9	31.0	4,603.9	1.70	13
	Mercer	1,591.5	140.3	916.8	193.4	2,842.0	1.05	21
	Miami	1,198.4	34.8	-	55.7	1,289.0	0.47	49
	Shelby	1,130.8	17.1	-	67.4	1,215.3	0.45	53
	Total West	**10,181**	838.5	**4,081**	**639.1**	15,739.6	5.79	**9**
Ohio	**Total**	**53,716.8**	**33,988.0**	**181,515.8**	**2,393**	**271,613.6**	**100**	**-**

[1]: MSW wood wastes excluded

Physical availability of biomass does not equal technical or economic feasibility for conversion to energy or any other outputs. The technical feasibility of various biomass conversion to energy processes is an on going research enterprise including at least the processes summarized in Figure 5. Economic feasibility can be confusing since it means financially profitable in a private market context to some and full social net benefits to others. Hitzhusen et.al. have developed a concept paper that includes a section on methods for estimating full social benefits and costs of energy options.

Assuming social benefit and cost values, the equimarginal principle in economics is a useful way of viewing a progression for the development of biomass for energy. It states that society should allocate its spending among energy options or programs so that the social value of the last dollar spent on each option or program is equal to the social value spent on every other option or program. In layman's terms, we "pick the low hanging fruit first" or develop the most cost effective or highest net benefit option first. The social valuation is critical particularly if for example, fossil fuels (e.g., coal and oil) have more unaccounted for environmental or social costs than wind energy and biofuels. In this case, simple financial analysis does not create a "level playing field." (see Hitzhusen, et. al.).