Appendix Table

Topic	System				
	Anaerobic Digestion	**Compost, Windrow**	**Compost, ASP**	**Landfill**	**Waste-to-Energy**
Relationship to Report Results	Several scenarios were examined in the full report. This table, and the accompanying article present only average scenario results to simplify presentation. AD and compost values presented in this table represent the average of scenario results presented in the full report. Environmental and cost results for anaerobic digestion are the average of base and low performance scenarios for the full capacity scenario. Results for composting are the average of base and improved performance scenarios using local transport assumptions (see report for scenario descriptions).				
Food Waste Specifications	Carbon Content, 44% of dry mass; Nitrogen Content, 2.5% of dry mass; Phosphorus Content, 0.9% of dry mass; C:N ratio, 18:1; Moisture Content, 69% of wet mass; Dry Mass, 31% (kg dry/kg wet).				
Energy Recovery	Biogas is produced during digestion and energy is recovered in onsite boilers and a combined heat and power system. The CHP system has an electrical efficiency of 40% and a thermal efficiency of 39% (Wiser, Schettler, et al., 2010)	None	None	Estimated using food waste specific inventory results from U.S. EPA's Municipal Solid Waste Decision Support Tool (MSW-DST) Produces 0.023 kWh/kg Food waste landfilled	Estimated using food waste specific inventory results from U.S. EPA's Municipal Solid Waste Decision Support Tool (MSW-DST) Produces 0.09 kWh/kg Food combusted

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Key Process Performance Variables	Volatile solids destruction: 68% of influent VS Biogas Yield: 16.8 ft^3/lb VSS destroyed	Mass loss during composting: 56% of wet mass Carbon degraded during composting: 59% of incoming C	Mass loss during composting: 56% of wet mass Carbon degraded during composting: 59% of incoming C	Represents performance of Massachusetts landfills where 81% of collected landfill gas is used for energy recovery, 19% is flared. National landfill statistics indicate that 68% of landfill gas is used for energy recovery, 24% flared and 8% vented to the atmosphere.	Food waste heat value: 1800 BTU/lb (MSW DST) Plant heat rate (BTU/kWh): 19214
Transportation	Food Collection to AD: 73 km Pellets to Land Application: 91 km Includes weight of water added during blending.	Food Collection to Compost: 81 km Compost to Land Application: 91 km	Food Collection to Compost: 81 km Compost to Land Application: 91 km	Food Collection to Landfill: 73 km	Food Collection to WTE: 73 km

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Process Air Emissions	Five percent of produced methane is lost as fugitive emissions (UNFCCC, 2012). Combustion emissions were included for the flare, CHP engine and pellet drier. Emission species include nitrogen oxides, volatile organic compounds, sulfur dioxide, particulate matter, carbon monoxide, ammonia, methane and nitrous oxide. See full report for specific LCI values.	A literature review informed air emissions released during composting. Including: ammonia, methane, nitrous oxide, volatile organic compounds and carbon monoxide. Literature review shows that between 0.003% and 2.5% of carbon entering the compost pile leaves as methane. This analysis assumes that 0.5% of carbon is released as methane. See full report for additional details.	A literature review informed air emissions released during composting. Including: ammonia, methane, nitrous oxide, volatile organic compounds and carbon monoxide. Analysis assumes that the ASP biofilter destroys methane emissions. Other emissions are the same as those from windrow composting. See full report for additional details.	Fugitive emissions are a function of landfill gas capture system in place. Specifics will vary regionally. See process performance. Combustion emissions are included for the flare and internal combustion engine. See full report for specific LCI values.	Combustion emissions of Sulfur dioxide, hydrochloric acid, nitrogen oxides, carbon monoxide, particulate matter, dioxins, methane, ammonia, hydrocarbons. See full report for specific LCI values.
Carbon sequestration	9% of carbon remaining in pelletized biosolids is sequestered for greater than 100 years.	14% of carbon remaining in finished compost is sequestered for greater than 100 years.	14% of carbon remaining in finished compost is sequestered for greater than 100 years.	0.6% of carbon in food waste remains in landfill after 100 years.	Not applicable

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Water Emissions	Emissions of nitrate and phosphorus to water were estimated based on N and P content of pelletized biosolids. Increased emissions in WWTF effluent were estimated using GPS-X.	Emissions of nitrate and phosphorus to water were estimated based on N and P content of finished compost. Same for both compost methods. No runoff emissions were assumed at the compost facility itself.	Emissions of nitrate and phosphorus to water were estimated based on N and P content of finished compost. Same for both compost methods. No runoff emissions were assumed at the compost facility itself.	Includes estimates of emissions to water from landfill leachate (MSW DST).	Not applicable
Key Cost Parameters	Electricity cost: 0.143 $/kWh Electricity savings (CHP): 0.129 $/kWh Renewable energy credit: 18.5 $/MWh Alternative energy credit: 17 $/MWh SSO tipping fee: 0.0125 $/gallon See report for more detail.	Tipping fee: 0.039 $/kg food waste Compost value: 0.017 $/kg compost Labor requirement: 0.57 hours/metric ton feedstock Land requirement: 3.2 m^2/Mg/year See report for more detail.	Tipping fee: 0.039 $/kg food waste Compost value: 0.017 $/kg compost Labor requirement: 0.57 hours/metric ton feedstock Land requirement: 0.59 m^2/Mg/year See report for more detail.	Not applicable	Not applicable

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	Name, LCIA Method, Units				
Impact Categories	Global warming potential, TRACI 2.1 (Bare, 2011), kg CO_2-equivalents (eq.)				
	Eutrophication potential, TRACI 2.1, kg Nitrogen-eq.				
	Particulate matter formation potential, TRACI 2.1, $PM_{2.5}$-eq.				
	Smog formation potential, TRACI 2.1, kg O_3-eq.				
	Acidification potential, TRACI 2.1, kg SO_2-eq.				
	Water use, ReCiPe (adapted) (Goedkoop, Heijungs, et al., 2009), m3				
	Fossil fuel depletion potential, ReCiPe, kg oil-eq.				
	Cumulative energy demand, Ecoinvent (Hischier, Weidema, et al., 2010), MJ				