

# SAMPLE WWTF ANAEROBIC DIGESTER MASS FLOW & ENERGY CALCULATIONS

(For 24,640 gpd WWTF sludge + 12,900 tons/yr of feedstocks)



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<b>MASS FLOW</b>	<b>C.Y./day</b>	<b>Gal./day</b>	<b>Percent</b>		
<b>Inputs to AD</b>					
WWTF sludge (4% to 6% TS)	122	24,640	77.7%		
Feedstocks (10% to 25% TS)	35	7,070	22.3%	*	
<b>Total Inputs (8% to 12% TS)</b>	157	31,710	100.0%		
<b>Outputs from AD</b>					
Digestate (~7% TS)	142	28,700	90.4%		
Biogas (~260 scfm @ ~2" w.c.)- (Equivalent C.Y./day from 90% VS reduction)	15		9.6%		
<b>Total Outputs from AD</b>	157		100.0%		
<b>Outputs from Solid Separator</b>					
Separated Liquid (~3% TS)	114	23,020	80.3%		
Separated Solids (~35% TS)	28		19.7%		
<b>Total Outputs from Solid Separator</b>	142		100.0%		
<b>Percent of Total Inputs to AD returned to WWTF</b>					
Separated Liquid (~3% TS)		23,020 =	72.6%	**	
Total Inputs to AD		31,710			
<b>Percent of WWTF Sludge returned to WWTF @ 3% TS</b>					
Separated Liquid (~3% TS)		23,020 =	93.4%	***	
WWTF Sludge (4% to 6% TS)		24,640			
<b>ENERGY</b>					
<b>Electrical Energy Output from CHP</b>	<b>C.Y./day</b>	<b>Equiv. Energy /C.Y.</b>	<b>kWe/hr</b>	<b>kWe %</b>	<b>Efficiency %</b>
WWTF Sludge	122	~2x	240	22.5%	
Feedstocks	35	~24x	825	77.5%	*
		<b>Btu/hr</b>			
<b>Total Electrical Energy Output</b>		<b>3,636,000</b>	<b>1,065</b>	100.0%	39.0%
		<b>Btu/hr</b>	<b>kWm/hr</b>		
<b>Heat Energy Output from CHP (water @160°F to 180°F)</b>					
<b>Total Heat Energy Output</b>		<b>3,756,000</b>	<b>1,100</b>		40.3%

**Notes:**

\* 77.5% of the energy comes from 22.3% of the Total Inputs

\*\* 72.6% (of Total Inputs to AD) in separated liquids due to 90% VS reduction and solids separation.

\*\*\* 93.4% (of WWTF sludge volume) gets returned to WWTF (@ 3% TS)