

OrganEcs- A Cost Estimating Tool for Managing Source Separated Organics



CLIMATE &
CLEAN AIR
COALITION



What is OrganEcs?

- **Who?** Developed under contract with Stratus Consulting and SCS Engineers for the CCAC w/ support from USEPA.
- **Goal?** Provide planning-level assistance
- **What?** Excel-based tool for estimating the costs associated with constructing and operating an organic waste management project for SSO. Developed with cost & operating data from published reports, technology vendors, industry professionals.
Can be used or overridden
- **Technologies Evaluated?** Open air composting with and w/o forced aeration, high-tech wet and dry AD, and low-tech wet anaerobic digestion

How does OrganEcs Work?

Collect



Select



Solve

Collect

Collect and enter primary data from your target city

- ✓ Economic Inputs
- ✓ Waste Inputs
- ✓ Facility Inputs

Economic and Financial Inputs

Guidance:

User should select the local currency from the drop-down menu and enter local data for all blue input cells. Prices should be entered in the current year.

Reset Default Values

Economic Assumptions		Units
Currency		
Currency	Mexico Peso	CHOOSE ONE
Currency Code		MXN Currency Code
Exchange Rate (1 Unit of Local Currency = X USD)	0.06	Local Currency
Labor (\$ in Current Year)		
Manager/Engineer - Labor Cost	\$60,000.00	\$/year
Operator - Labor Cost	\$35,000.00	\$/year
Facility Operations (\$ in Current Year)		
Gate Fee - Yard Wastes	\$30.00	\$/tonne
Gate Fee - Food Wastes	\$70.00	\$/tonne
Gate Fee - Manure/Sludge	\$70.00	\$/tonne
Gate Fee - Other Wastes	\$30.00	\$/tonne
Avoided Landfill Disposal Fee	\$0.00	\$/tonne
Residual Disposal Fee	\$0.00	\$/tonne
Transportation Fee	\$0.00	\$/tonne/km
Process Water Purchase Price	\$0.00	\$/m3
Wastewater Treatment Cost	\$0.00	\$/m3
Purchased Bulking Agent Cost (Wood Chips)	\$10.00	\$/tonne

Select

Choose default data for select assumptions or override values with site specific data

Set /Reset Default Values

Technology	Composting Without Forced Aeration	
Soil Product Selected	Compost	
Total Annual Waste to AD in YR 1 of Operations	Not Applicable	
Facility Design Capacity	30,000	
Total Annual Waste to Composting in YR 1 of Operations	30,000	
Scenario	Low Capex	High Capex
Facility Operations		
Operating Days/Year	310	310
Land Requirement (ha/tonne)	0.0001	0.0001
Electricity Demand (kWh/tonne)	4.0	4.0
Fuel Demand (liters/tonne)	7.5000	7.5000
Net Electricity Output (kWh/tonne)	Not Applicable	Not Applicable
Net Heat Output (MMBtu/tonne)	Not Applicable	Not Applicable
Primary Screening Residues (% of incoming feedstock)	0.0%	0.0%
Process Water Requirements (m3/tonne)	Calculated on Tab 6	Calculated on Tab 6
Digestate Produced (% of incoming feedstock)	Not Applicable	Not Applicable
Dewatered Solids Fraction Produced (% of digested feedstock)	Not Applicable	Not Applicable
Liquid Fraction Produced (% of digested feedstock)	Not Applicable	Not Applicable
Percentage of Liquid Returned to Digestion Process (%)	Not Applicable	Not Applicable
Wastewater Treatment Requirements (m3/tonne)	Not Applicable	Not Applicable
Composting Capex Reduction Factor for Co-Location (%)	Not Applicable	Not Applicable
Compost Production (% of incoming feedstock)	50%	50%
Final Screening Residues (% of incoming feedstock)	2%	2%

Solve

Use macro buttons to solve for gate fee, product sale price OR project IRR

Sensitivity Analysis		
Capex Sensitivity Analysis	Capex As Is	CHOOSE ONE
Percent Change	0%	%
O&M Sensitivity Analysis	O&M As Is	CHOOSE ONE
Percent Change	0%	%
Electricity Generation Sensitivity Analysis	Elec Gen As Is	CHOOSE ONE
Percent Change	0%	%

Reminder: Did you set default values on the 8-Default Values tab?

Solve for Gate Fee

Solve for Product Sale Price

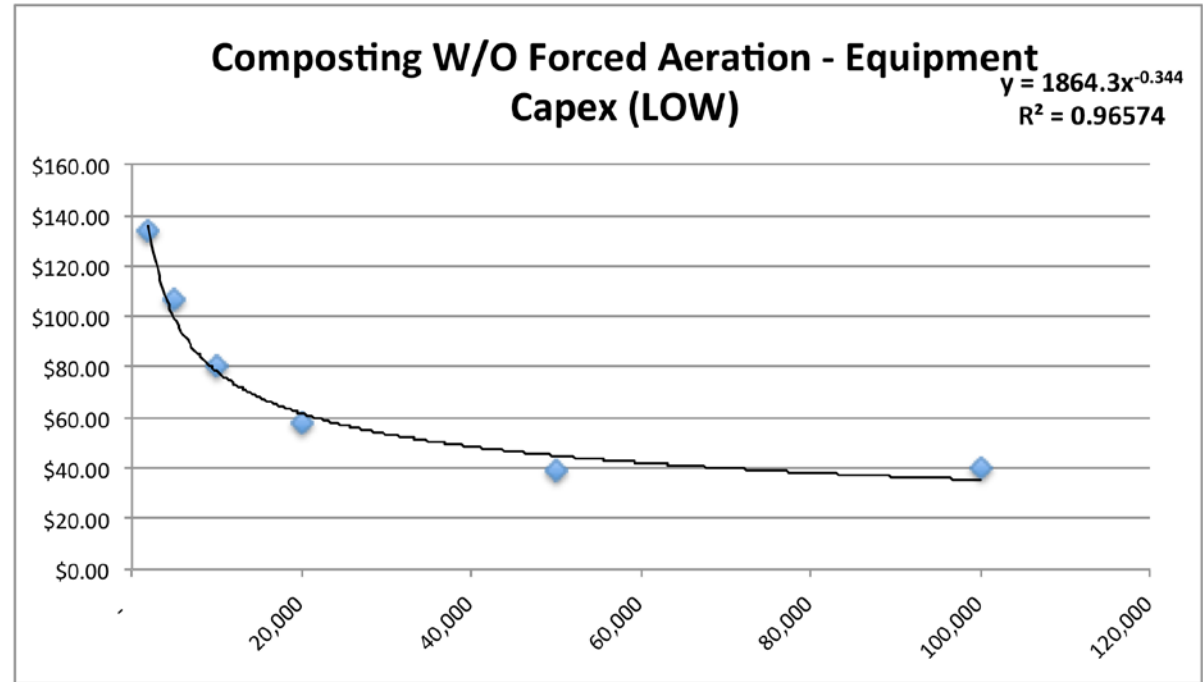
Solve for IRR (Reset to User Entries)

Note: If output values appear highly unusual, save changes to tool, close, and re-open document.

Summary		USD		Local Currency	
Gate Fee	All Waste	Low	High	Low	High
Composting W/O Forced Aeration		\$34.00	\$39.00	MXN 567.00	MXN 650.00
Composting With Forced Aeration		\$34.00	\$52.00	MXN 567.00	MXN 867.00
High-Tech Wet Anaerobic Digestion		\$47.00	\$58.00	MXN 784.00	MXN 967.00
High-Tech Dry Anaerobic Digestion		\$63.00	\$79.00	MXN 1,050.00	MXN 1,317.00
Low-Tech Wet Anaerobic Digestion		\$35.00	\$40.00	MXN 584.00	MXN 667.00

Predicting Cost and Facility Performance

- Built with European and US capital costing data but costs can be localized by applying cost adjustment factors
 - Equipment vs. Site Development Capex
 - Adjusted to 2014 \$ (consumer and construction cost index)



- Facility performance and O&M cost components based on vendor data, inputs from industry experts & published literature- costs estimated with primary data from user
- Range of results- Low vs. High Cost Scenarios
- Sensitivity analysis: +/- X% of Capex, O&M, Electricity generation

Understanding Model Outputs

Can local markets and waste budgets support the development of a SSO processing facility?

Solve for Gate Fee

User can solve gate fee for:

- Yard Waste
- Food Waste
- Manure/Sludge Waste
- ALL Waste

Solve for Product Sale Price

- Compost
- Electricity

Solve for Project IRR

- All inputs reset to user entries

Additional Features and Limitations

- Units = METRIC “tonnes” of SSO; OrganEcs does not account for cost of establishing a dedicated SSO collection program
- Guidance boxes are included on each tab and in notes hovering above entry cells
- Tool is flexible- User can rely on default values or enter site specific data based on local processing facilities or vendor proposals
- Model outputs should be viewed as preliminary, planning level estimates
- Technologies assume municipal scale composting – individual minimum throughput requirements assigned to each technology

Questions?

Thank you

