

Real Life is Too Complicated for Simple Payback

Don't Ever Use it Again



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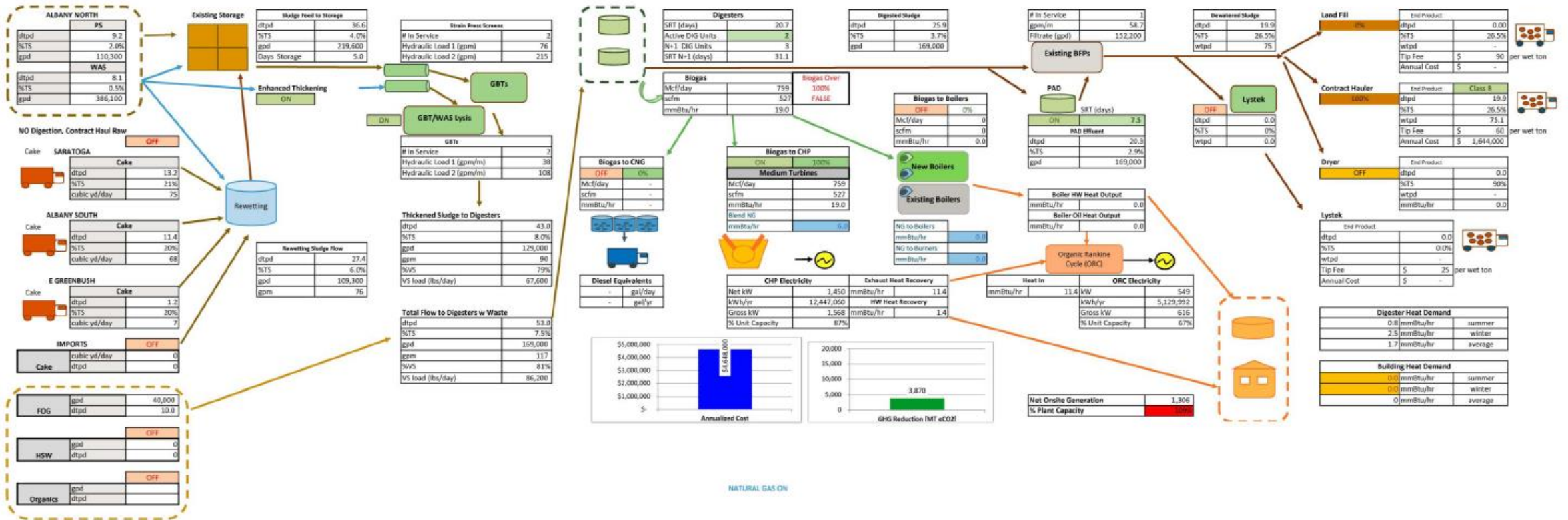


WIKIPEDIA
The Free Encyclopedia

According to Wikipedia, What is simple payback?

- In capital budgeting refers to the period of time required to recoup the funds expended in an investment, or to reach the break-even point.
- As a tool of analysis it is often used because it is easy to apply and easy to understand for most individuals, regardless of academic training or field of endeavor.
- As a stand-alone tool to compare an investment to "doing nothing," it has no explicit criteria for decision-making (except, perhaps, that the payback period should be less than infinity).
- Considered a method of analysis with serious limitations and qualifications for its use, because it does not account for the time value of money, risk, financing, or other important considerations.

Let's Build a Model!



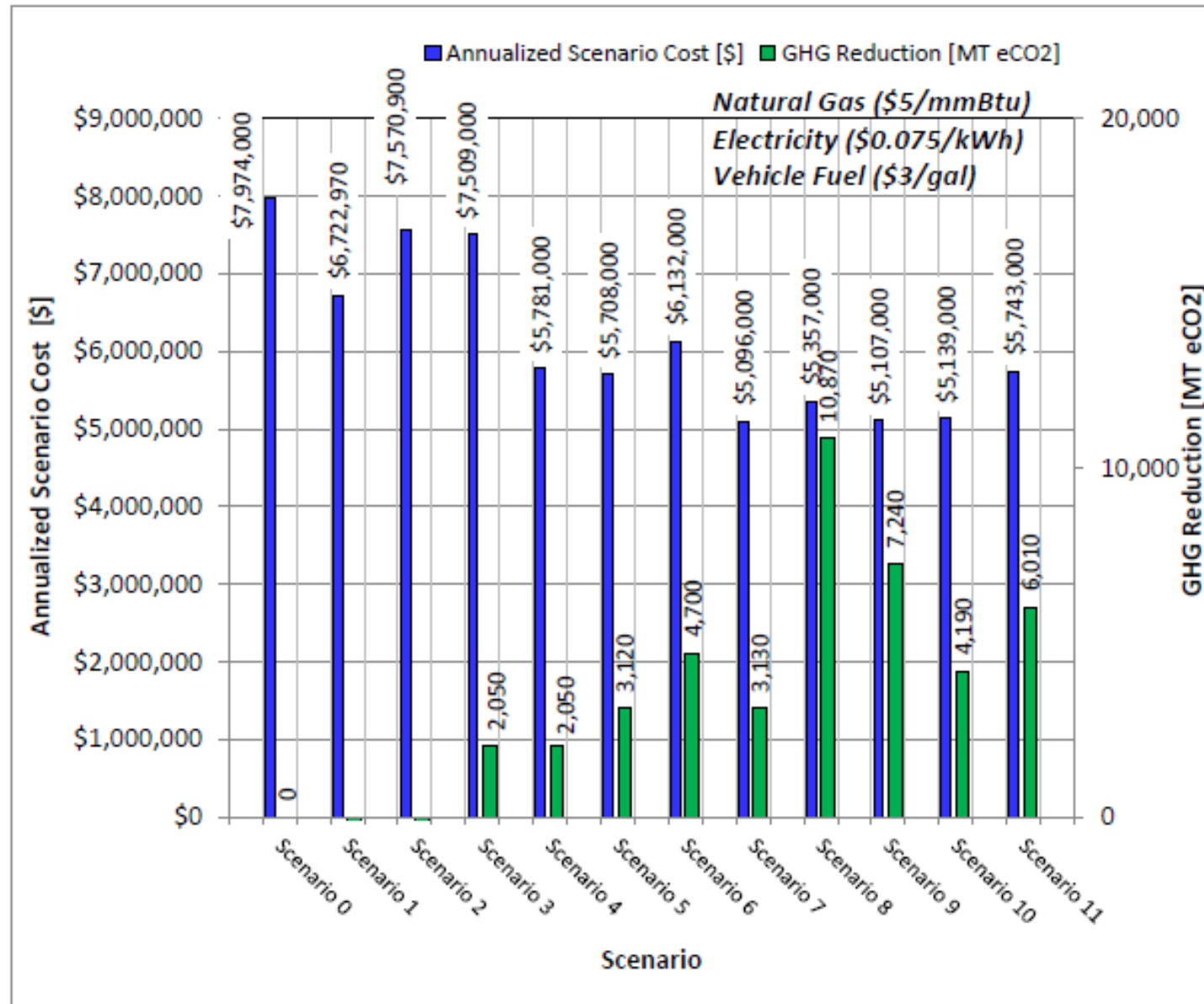
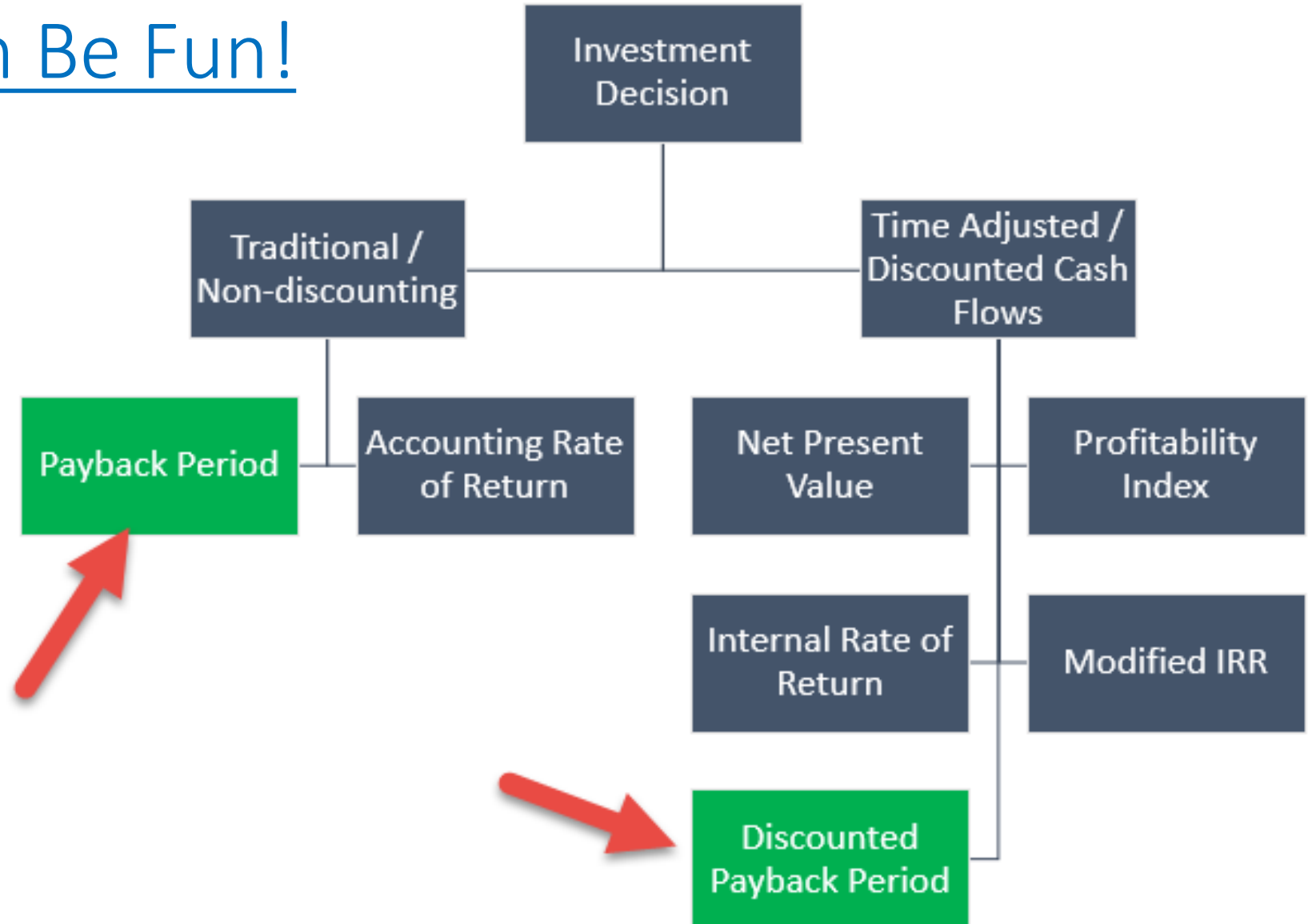


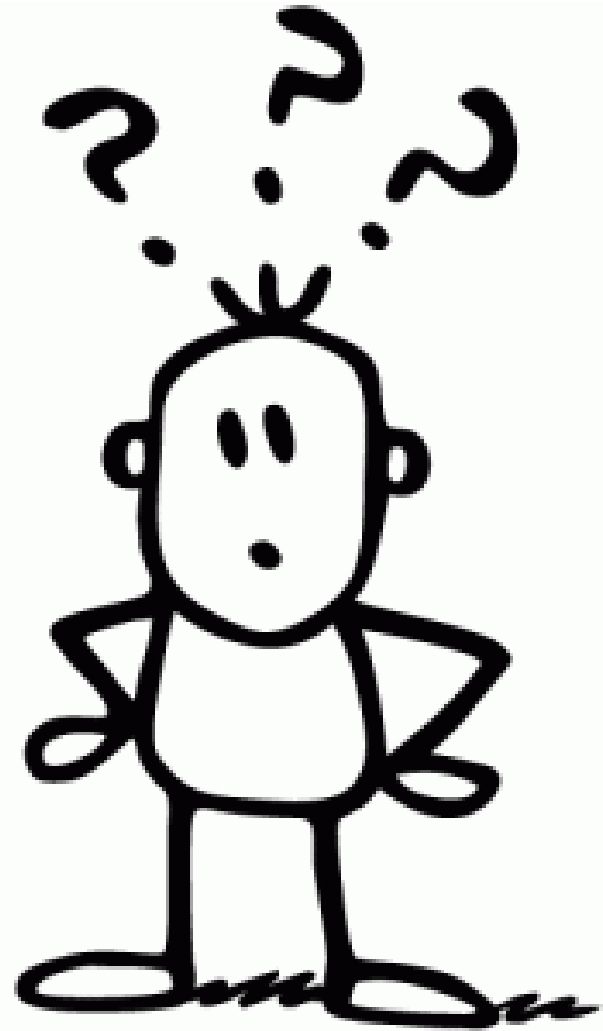
Figure 10: Initial Model Scenario Results

Accounting Can Be Fun!



So what makes sense?

- Depends on what you are trying to do
- Decisions are made by people
- Logic versus emotions
- Easily becomes overly complicated





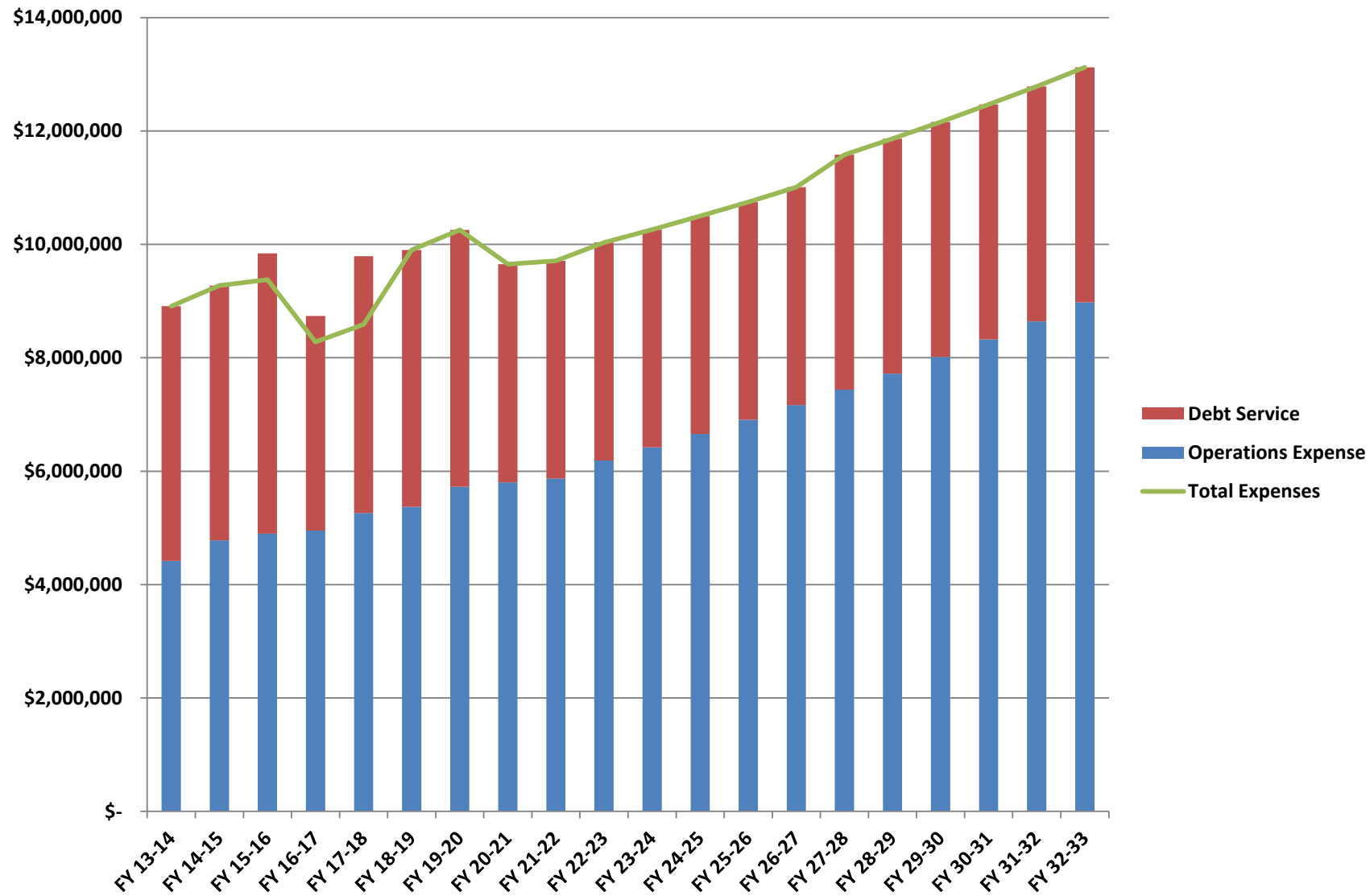
Idea #1
The Big Picture
Choose your Future



Frederick-Winchester Service Authority's Opequon Water Reclamation Facility (12.6 MGD)



FWSA – the Next 20 Years (The Problem)



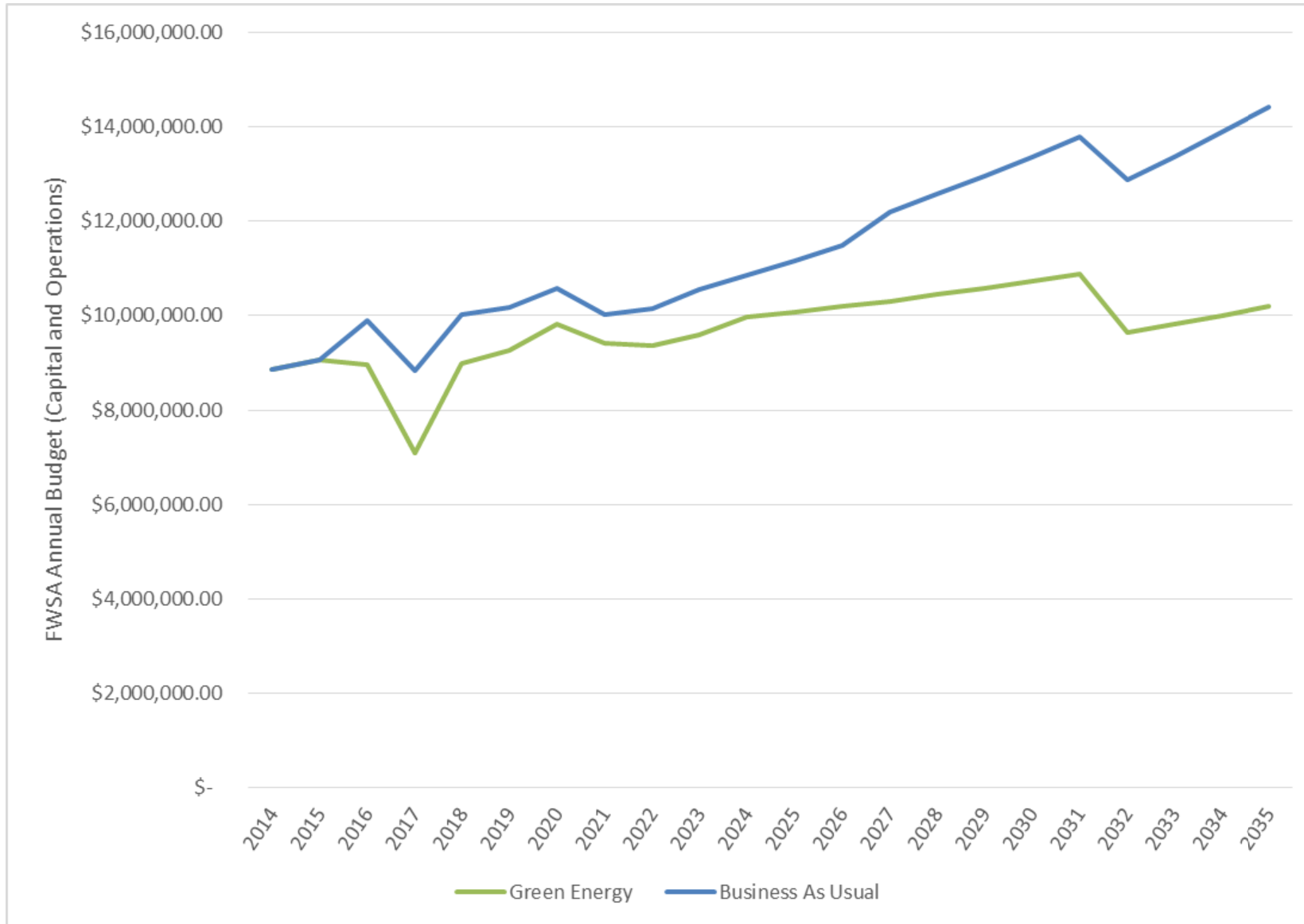
Their Dilemma

Is it better for us and the community
to keep doing the same things
or
should we do something different?

The Four Project Objectives

- A fully upgraded facility
- New capabilities to support future community economic development
- A savings of at least \$20,000,000 for the Community
- Reduce the need for future rate increases to citizens

The Choice



2014



Opequon Water Reclamation

Google Earth

Imagery Date: 10/20/2013 39°10'38.04" N 78°04'36.26" W elev 528 ft eye alt 2879 ft

10/20/2013

2017



Opequon Water Reclamation

Google Earth

Imagery Date: 5/15/2017 39°10'38.04" N 78°04'36.26" W elev 528 ft eye alt 2879 ft







Idea #2
Money In Money Out
Manage your Cash





Project Price Estimate

Improvement	Purpose/Note	Price Estimate
Headworks Improvements	Long Term Control Plan	\$ 2,500,000
Digester Improvements (Mixing/Covers/Heat Exch.)	Asset Renewal	\$ 2,500,000
Organics/Septage Receiving Station	Efficiency and New Revenue	\$ 1,000,000
Organics/WAS EQ Tank	Efficiency and New Revenue	\$ 500,000
Sludge Storage Tank	Efficiency and New Revenue	\$ 500,000
Cogeneration System and Switchgear	Efficiency and New Revenue	\$ 1,250,000
Engineering - Design & Construction Support	<i>Assume about 6-7% of price</i>	\$ 700,000
General Conditions/Project Delivery	<i>18 months @ \$30k per</i>	\$ 540,000
Total Price Estimate		\$ 9,490,000

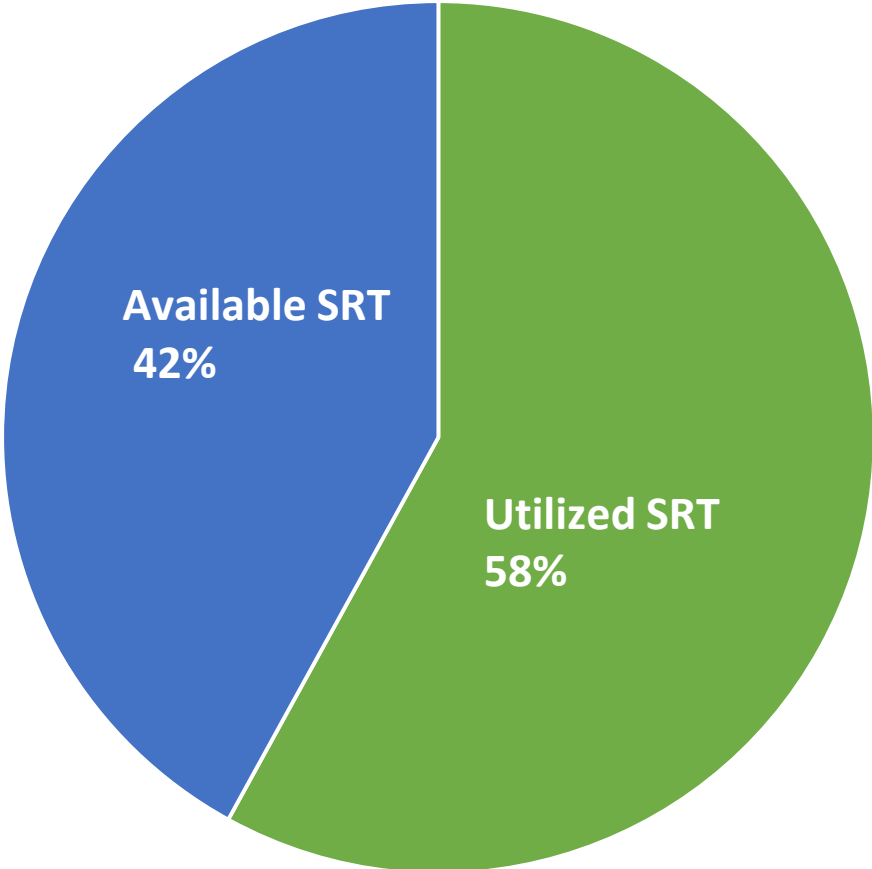
Debt Cost Allocation - Annual Cash Flow								
		Financials Updated	4/9/2018		Savings	Current Cost	% Savings	Annual Savings
		Interest Rate	2.50%		Electricity	\$ 110,000	70%	\$ 77,000
		Total Project Value	\$9,490,000		Natural Gas	\$ 40,000	90%	\$ 36,000
		Finance Period (yrs)	20		Biosolids Disposal	\$ (50,000)	100%	\$ (50,000)
						gallons per day	tip fee per gallon	Annual Revenue (5 day week)
		Debt Cost Allocation			Organics Revenue	16,000	\$ 0.055	\$ 228,800
		Project Savings & New Revenue	47.9%					
		New Capital Expense	52.1%					
PROJECT'S OPERATIONAL SAVINGS AND NEW REVENUE GENERATION								Debt Service
CY Start	Year	Electricity Cost Savings	Natural Gas Savings	Biosolids Disposal Savings	Organics and Septage Revenue	Total Savings and Revenue	New Annual Capital Expense	Annual Project Debt Payment
2019	Construction	\$ 7,700			\$ 45,760	\$ 53,460	\$ -	\$ -
2020	1	\$ 77,000	\$ 36,000	\$ (50,000)	\$ 228,800	\$ 291,800	\$ 316,956	\$ 608,756
2021	2	\$ 77,000	\$ 36,000	\$ (50,000)	\$ 228,800	\$ 291,800	\$ 316,956	\$ 608,756
2022	3	\$ 77,000	\$ 36,000	\$ (50,000)	\$ 228,800	\$ 291,800	\$ 316,956	\$ 608,756
2023	4	\$ 77,000	\$ 36,000	\$ (50,000)	\$ 228,800	\$ 291,800	\$ 316,956	\$ 608,756
2024	5	\$ 77,000	\$ 36,000	\$ (50,000)	\$ 228,800	\$ 291,800	\$ 316,956	\$ 608,756
2025	6	\$ 77,000	\$ 36,000	\$ (50,000)	\$ 228,800	\$ 291,800	\$ 316,956	\$ 608,756
2026	7	\$ 77,000	\$ 36,000	\$ (50,000)	\$ 228,800	\$ 291,800	\$ 316,956	\$ 608,756
2027	8	\$ 77,000	\$ 36,000	\$ (50,000)	\$ 228,800	\$ 291,800	\$ 316,956	\$ 608,756
2028	9	\$ 77,000	\$ 36,000	\$ (50,000)	\$ 228,800	\$ 291,800	\$ 316,956	\$ 608,756
2029	10	\$ 77,000	\$ 36,000	\$ (50,000)	\$ 228,800	\$ 291,800	\$ 316,956	\$ 608,756
2030	11	\$ 77,000	\$ 36,000	\$ (50,000)	\$ 228,800	\$ 291,800	\$ 316,956	\$ 608,756
2031	12	\$ 77,000	\$ 36,000	\$ (50,000)	\$ 228,800	\$ 291,800	\$ 316,956	\$ 608,756
2032	13	\$ 77,000	\$ 36,000	\$ (50,000)	\$ 228,800	\$ 291,800	\$ 316,956	\$ 608,756
2033	14	\$ 77,000	\$ 36,000	\$ (50,000)	\$ 228,800	\$ 291,800	\$ 316,956	\$ 608,756
2034	15	\$ 77,000	\$ 36,000	\$ (50,000)	\$ 228,800	\$ 291,800	\$ 316,956	\$ 608,756
2035	16	\$ 77,000	\$ 36,000	\$ (50,000)	\$ 228,800	\$ 291,800	\$ 316,956	\$ 608,756
2036	17	\$ 77,000	\$ 36,000	\$ (50,000)	\$ 228,800	\$ 291,800	\$ 316,956	\$ 608,756
2037	18	\$ 77,000	\$ 36,000	\$ (50,000)	\$ 228,800	\$ 291,800	\$ 316,956	\$ 608,756
2038	19	\$ 77,000	\$ 36,000	\$ (50,000)	\$ 228,800	\$ 291,800	\$ 316,956	\$ 608,756
2039	20	\$ 77,000	\$ 36,000	\$ (50,000)	\$ 228,800	\$ 291,800	\$ 316,956	\$ 608,756
	Total	\$ 1,547,700	\$ 720,000	\$ (1,000,000)	\$ 4,621,760	\$ 5,836,000	\$ 6,339,125	\$ 12,175,125
Percentage of Total Debt Service						47.9%	52.1%	

Idea #3
Life in Reverse
What can I afford?

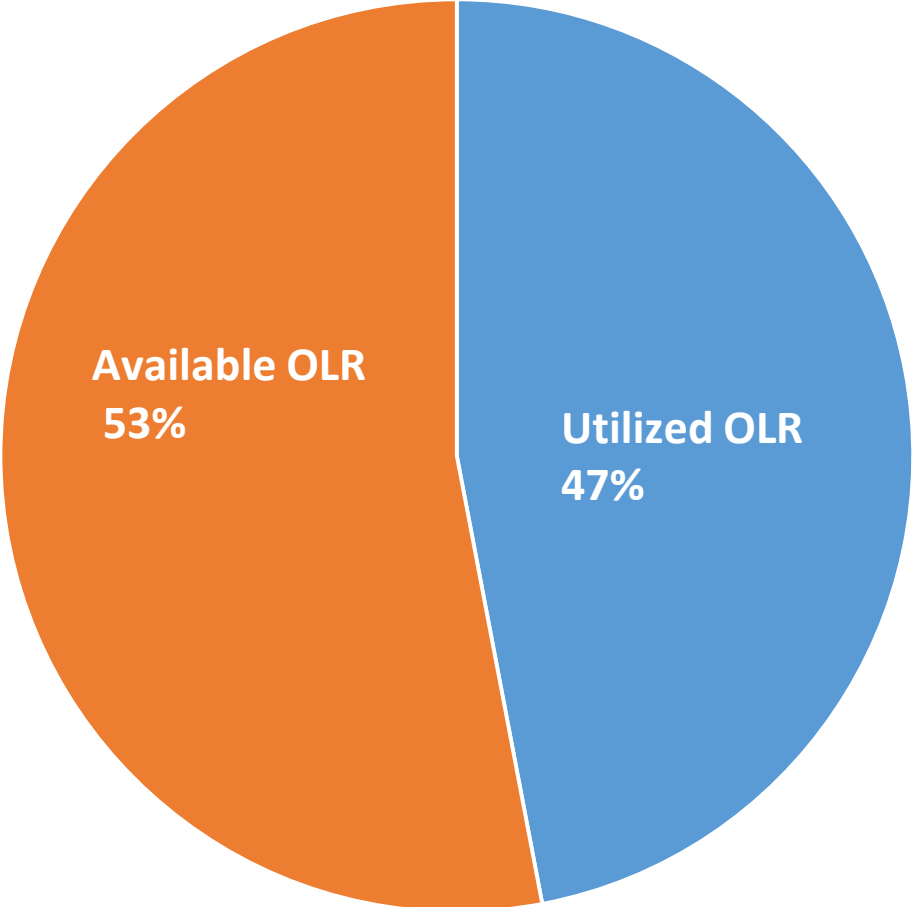




Available Hydraulic Capacity



Available Organic Capacity



FWSA - Options and Capital Expense Finance Potential



Interest Rate	4.50%
Finance Term	20
Debt Coverage Requirement	110%
Consumed Digester Capacity	90%

Waste	Volume	Tipping Fee Per Gallon	Annual Revenue
Chicken Sludge	24,000	\$ 0.10	\$ 788,400
DAF Sludge	18,000	\$ 0.10	\$ 591,300
Organics (Current Baseline)	32,000	\$ 0.07	\$ 817,600
Biosolids			
Biosolids disposal annual costs			\$ 430,000
Dryer Efficiency			90%
Disposal costs per wet ton (landfill)			\$ 42
Chemical Savings (Reduction in Micro C Use)			\$ 150,000
Biogas Value per MMTBU			\$ 3.00
Biogas Use for Existing Engine (MMBTU/day)			194

		OPERATIONAL COSTS AND REVENUE IMPACT						
Option	Options	Chicken Sludge	DAF Sludge	Sludge Disposal (Costs or Savings)	Chemical (Costs or Savings)	Total Savings and Revenue	Capital Expense Finance Potential	Annual Biogas Value
	<i>All Options Include Receiving Stations Improvements</i>							
1	Existing Digesters (Chicken)	\$ 788,400	\$ -	\$ (82,782)	\$ 150,000	\$ 855,618		\$ 693,000
2	Existing Digesters (DAF)		\$ 591,300	\$ (75,884)	\$ 150,000	\$ 665,417		\$ 684,000
3	Add 4th Digester (Chicken and DAF)	\$ 788,400	\$ 591,300	\$ (158,666)	\$ 150,000	\$ 1,371,035		\$ 1,359,000
4	Existing Digesters and Add Dryer		\$ 591,300	\$ 387,000	\$ 150,000	\$ 1,128,300		
5	Add 4th Digester and Dryer	\$ 788,400	\$ 591,300	\$ 387,000	\$ 150,000	\$ 1,916,700		





For More Information

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