

# PROPOSED NEW GENERATION PROJECT

BACKGROUND, OPTIONS,  
RECOMMENDATION, NEXT STEPS



# PURPOSE

- EXPLAIN NEED AND BENEFITS TO CITY
- ALTERNATIVES CONSIDERED
- RECOMMENDED APPROACH
- FINANCING AND ESTIMATED CASH FLOW
- SEEK DIRECTION AND APPROVAL ON NEXT STEPS

# BACKGROUND – HOW CITY ENERGY REQUIREMENTS ARE MET

- CITY OWNED UTILITY (OVER 110 YEARS)
  - CONTROL OVER DESTINY AND RATES
  - LOCAL GENERATION – 60-MW
  - PURCHASE 1.9-MW SWPA HYDRO
  - REVENUES TO CITY
  - ECONOMIC DEVELOPMENT ASSET
- GRDA REQUIREMENTS CONTRACT TO 2042
  - CITY RESOURCES ARE PART OF THE GRDA PORTFOLIO
  - WILL TIE CAPACITY PAYMENTS TO TERM OF POWER PURCHASE AGREEMENT THRU 2042
- PEAK DEMAND – 130-MW; 83% LOAD FACTOR
  - CRNF ADDED 13-MW AND PLANS ANOTHER 15-MW

# SELECTED KEY REGULATORS AND ISSUES

- ENVIRONMENTAL – U.S. EPA (usually via KDHE)
  - CO2 RULEMAKINGS ON NEW AND EXISTING UNITS
    - COAL, COMBUSTION TURBINES BOTH SIMPLE AND COMBINED
    - CURRENT PROPOSED RULE DOES NOT INCLUDE RECIPS
  - RECIPROCATING INTERNAL COMBUSTION ENGINES (RICE)
    - RICE/NESHAPS ON EXISTING UNITS
  - NEW RULES ON EXISTING FLEET COULD FORCE “UPGRADE VS. RETIRE” DECISIONS
    - EPA Cross State Air Pollution Rule (CSPAR)
      - Will place limits on Ton of Nitrous Oxides emitted from Boiler 4, thereby requiring the purchase of “Allowance Credits” for operation exceeding allotted allowances.
- TRANSMISSION ACCESS & MARKETS
  - SPP INTEGRATED MARKETPLACE STARTED MARCH 1st, 2014
  - DISPATCHED 8 TIMES IN MARCH, 9 TIMES IN APRIL & 3 TIMES IN MAY

# Current Resources

- **AGE OF EXISTING FLEET; USEFUL LIFE**
  - UNIT 1 (2 MW) – ENTERED SERVICE 2007
  - UNIT 2 (2 MW) - ENTERED SERVICE 2007
  - UNIT 6 (17.6-MW) – ENTERED SERVICE 1955
    - Next retirement candidate, forecast for 2025 if no capacity added?
  - UNIT 7 (38.2-MW) – ENTERED SERVICE 1971

# NEW GENERATION OPTIONS CONSIDERED

- New generation under revised GRDA contract
  - Concept is a capacity payment that supports the project
  - GRDA consent letter for 56-MW On-Line mid 2016
  - Unit 6 would be removed from Capacity Payment Structure
  - Unit 7 Capacity Payment Structure reduced to 30 MW from 34 Net Demonstrated Capacity
  - Units 1 & 2, Diesel Generators to be removed from Capacity Payment Structure
  - Capacity Payments based on 30 MW (Unit 7) & 56 MW New Units, totaling 86 MW
- Generation feasibility analysis by consultant (Guernsey)
  - \$67 million net benefit to City over the life of the GRDA Contract

	<b>Amount of Debt Issued</b>	<b>Total Payment after 25 Years</b>	<b>Annual Debt Service Average</b>	<b>Annual Capacity Payment with New Generation</b>	<b>Net Annual Benefit (Annual Capacity Payment Minus Annual Debt Service)</b>	<b>Current Annual Capacity Payment (at 100% Availability)</b>
	Based on 25 Year Term					
	\$60,000,000.00	\$84,332,317.20	\$3,373,292.69	\$6,284,304.00	\$2,911,011.31	\$3,127,680.00
	\$58,000,000.00	\$81,521,239.96	\$3,260,849.60	\$6,284,304.00	\$3,023,454.40	\$3,127,680.00
	\$55,000,000.00	\$77,304,624.10	\$3,092,184.96	\$6,284,304.00	\$3,192,119.04	\$3,127,680.00

### Net Benefit to City Through 2042

Debt Issued				\$60,000,000.00	\$58,000,000.00	\$55,000,000.00
Total Debt Service 25 years				\$84,332,317.20	\$81,521,239.96	\$77,304,624.10
Total Capacity Payment 26 years				\$163,391,904.00	\$163,391,904.00	\$163,391,904.00
				\$79,059,586.80	\$81,870,664.04	\$86,087,279.90
Fixed Operation & Maintenance Costs over 25 yrs.				\$11,687,500.00	\$11,687,500.00	\$11,687,500.00
<b>Net Cash to City Over the Life of the Contract</b>				<b>\$67,372,086.80</b>	<b>\$70,183,164.04</b>	<b>\$74,399,779.90</b>

Projected Revenues										
Year	Proposed Reciprocating Engine Plant					Unit 7				
	Fixed Payments					Fixed Payments				
	Capacity Payment	Installed Reserve Payment	Spinning Reserve Payment	Ready Reserve Payment	Totals	Capacity Payment	Installed Reserve Payment	Spinning Reserve Payment	Ready Reserve Payment	Totals
2014										
2015										
2016	\$ 1,672,902	\$ 252,450	\$ 84,150	\$ 252,450	\$ 2,261,952	\$745,200.00	\$135,000.00	\$0.00	\$0.00	\$880,200.00
2017	\$ 3,345,804	\$ 504,900	\$ 168,300	\$ 504,900	\$ 4,523,904	\$1,490,400.00	\$270,000.00	\$0.00	\$0.00	\$1,760,400.00
2018	\$ 3,345,804	\$ 504,900	\$ 168,300	\$ 504,900	\$ 4,523,904	\$1,490,400.00	\$270,000.00	\$0.00	\$0.00	\$1,760,400.00
2019	\$ 3,345,804	\$ 504,900	\$ 168,300	\$ 504,900	\$ 4,523,904	\$1,490,400.00	\$270,000.00	\$0.00	\$0.00	\$1,760,400.00
2020	\$ 3,345,804	\$ 504,900	\$ 168,300	\$ 504,900	\$ 4,523,904	\$1,490,400.00	\$270,000.00	\$0.00	\$0.00	\$1,760,400.00
2021	\$ 3,345,804	\$ 504,900	\$ 168,300	\$ 504,900	\$ 4,523,904	\$1,490,400.00	\$270,000.00	\$0.00	\$0.00	\$1,760,400.00
2022	\$ 3,345,804	\$ 504,900	\$ 168,300	\$ 504,900	\$ 4,523,904	\$1,490,400.00	\$270,000.00	\$0.00	\$0.00	\$1,760,400.00
2023	\$ 3,345,804	\$ 504,900	\$ 168,300	\$ 504,900	\$ 4,523,904	\$1,490,400.00	\$270,000.00	\$0.00	\$0.00	\$1,760,400.00
2024	\$ 3,345,804	\$ 504,900	\$ 168,300	\$ 504,900	\$ 4,523,904	\$1,490,400.00	\$270,000.00	\$0.00	\$0.00	\$1,760,400.00
2025	\$ 3,345,804	\$ 504,900	\$ 168,300	\$ 504,900	\$ 4,523,904	\$1,490,400.00	\$270,000.00	\$0.00	\$0.00	\$1,760,400.00
2026	\$ 3,345,804	\$ 504,900	\$ 168,300	\$ 504,900	\$ 4,523,904	\$1,490,400.00	\$270,000.00	\$0.00	\$0.00	\$1,760,400.00
2027	\$ 3,345,804	\$ 504,900	\$ 168,300	\$ 504,900	\$ 4,523,904	\$1,490,400.00	\$270,000.00	\$0.00	\$0.00	\$1,760,400.00
2028	\$ 3,345,804	\$ 504,900	\$ 168,300	\$ 504,900	\$ 4,523,904	\$1,490,400.00	\$270,000.00	\$0.00	\$0.00	\$1,760,400.00
2029	\$ 3,345,804	\$ 504,900	\$ 168,300	\$ 504,900	\$ 4,523,904	\$1,490,400.00	\$270,000.00	\$0.00	\$0.00	\$1,760,400.00
2030	\$ 3,345,804	\$ 504,900	\$ 168,300	\$ 504,900	\$ 4,523,904	\$1,490,400.00	\$270,000.00	\$0.00	\$0.00	\$1,760,400.00
2031	\$ 3,345,804	\$ 504,900	\$ 168,300	\$ 504,900	\$ 4,523,904	\$1,490,400.00	\$270,000.00	\$0.00	\$0.00	\$1,760,400.00
2032	\$ 3,345,804	\$ 504,900	\$ 168,300	\$ 504,900	\$ 4,523,904	\$1,490,400.00	\$270,000.00	\$0.00	\$0.00	\$1,760,400.00
2033	\$ 3,345,804	\$ 504,900	\$ 168,300	\$ 504,900	\$ 4,523,904	\$1,490,400.00	\$270,000.00	\$0.00	\$0.00	\$1,760,400.00
2034	\$ 3,345,804	\$ 504,900	\$ 168,300	\$ 504,900	\$ 4,523,904	\$1,490,400.00	\$270,000.00	\$0.00	\$0.00	\$1,760,400.00
2035	\$ 3,345,804	\$ 504,900	\$ 168,300	\$ 504,900	\$ 4,523,904	\$1,490,400.00	\$270,000.00	\$0.00	\$0.00	\$1,760,400.00
2036	\$ 3,345,804	\$ 504,900	\$ 168,300	\$ 504,900	\$ 4,523,904	\$1,490,400.00	\$270,000.00	\$0.00	\$0.00	\$1,760,400.00
2037	\$ 3,345,804	\$ 504,900	\$ 168,300	\$ 504,900	\$ 4,523,904	\$1,490,400.00	\$270,000.00	\$0.00	\$0.00	\$1,760,400.00
2038	\$ 3,345,804	\$ 504,900	\$ 168,300	\$ 504,900	\$ 4,523,904	\$1,490,400.00	\$270,000.00	\$0.00	\$0.00	\$1,760,400.00
2039	\$ 3,345,804	\$ 504,900	\$ 168,300	\$ 504,900	\$ 4,523,904	\$1,490,400.00	\$270,000.00	\$0.00	\$0.00	\$1,760,400.00
2040	\$ 3,345,804	\$ 504,900	\$ 168,300	\$ 504,900	\$ 4,523,904	\$1,490,400.00	\$270,000.00	\$0.00	\$0.00	\$1,760,400.00
2041	\$ 3,345,804	\$ 504,900	\$ 168,300	\$ 504,900	\$ 4,523,904	\$1,490,400.00	\$270,000.00	\$0.00	\$0.00	\$1,760,400.00
2042	\$ 1,672,902	\$ 252,450	\$ 84,150	\$ 252,450	\$ 2,261,952	\$745,200.00	\$135,000.00	\$0.00	\$0.00	\$880,200.00
				Totals	\$117,621,504	\$38,750,400.00	\$7,020,000.00		Totals	\$45,770,400.00
<b>Total Capacity Payment with Unit #7</b>									<b>\$163,391,904.00</b>	



<b>Proposed Reciprocating Engine Plant</b>							
<b>Variable Payments/Estimated Revenues Based on Dispatched Hours</b>							
	<b>1000 hrs/yr</b>		<b>1500 hrs/yr</b>		<b>2000 hrs/yr</b>		<b>4000 hrs/yr</b>
2014							
2015							
2016	\$ 182,325		\$ 273,488		\$ 364,650		\$ 729,300
2017	\$ 364,650		\$ 546,975		\$ 729,300		\$ 1,458,600
2018	\$ 364,650		\$ 546,975		\$ 729,300		\$ 1,458,600
2019	\$ 364,650		\$ 546,975		\$ 729,300		\$ 1,458,600
2020	\$ 364,650		\$ 546,975		\$ 729,300		\$ 1,458,600
2021	\$ 364,650		\$ 546,975		\$ 729,300		\$ 1,458,600
2022	\$ 364,650		\$ 546,975		\$ 729,300		\$ 1,458,600
2023	\$ 364,650		\$ 546,975		\$ 729,300		\$ 1,458,600
2024	\$ 364,650		\$ 546,975		\$ 729,300		\$ 1,458,600
2025	\$ 364,650		\$ 546,975		\$ 729,300		\$ 1,458,600
2026	\$ 364,650		\$ 546,975		\$ 729,300		\$ 1,458,600
2027	\$ 364,650		\$ 546,975		\$ 729,300		\$ 1,458,600
2028	\$ 364,650		\$ 546,975		\$ 729,300		\$ 1,458,600
2029	\$ 364,650		\$ 546,975		\$ 729,300		\$ 1,458,600
2030	\$ 364,650		\$ 546,975		\$ 729,300		\$ 1,458,600
2031	\$ 364,650		\$ 546,975		\$ 729,300		\$ 1,458,600
2032	\$ 364,650		\$ 546,975		\$ 729,300		\$ 1,458,600
2033	\$ 364,650		\$ 546,975		\$ 729,300		\$ 1,458,600
2034	\$ 364,650		\$ 546,975		\$ 729,300		\$ 1,458,600
2035	\$ 364,650		\$ 546,975		\$ 729,300		\$ 1,458,600
2036	\$ 364,650		\$ 546,975		\$ 729,300		\$ 1,458,600
2037	\$ 364,650		\$ 546,975		\$ 729,300		\$ 1,458,600
2038	\$ 364,650		\$ 546,975		\$ 729,300		\$ 1,458,600
2039	\$ 364,650		\$ 546,975		\$ 729,300		\$ 1,458,600
2040	\$ 364,650		\$ 546,975		\$ 729,300		\$ 1,458,600
2041	\$ 364,650		\$ 546,975		\$ 729,300		\$ 1,458,600
2042	\$ 182,325		\$ 273,488		\$ 364,650		\$ 729,300
	\$9,480,900		\$14,221,350		\$18,961,800		\$37,923,600

# Electric Department Recommendation

- Pursue 56 MW (gross) reciprocating engine plant
  - Quick-start local generation - start to full load in 8 minutes
  - Single fuel (natural gas) or Dual fuel (natural gas/diesel)
  - Efficient heat rate of ~8.0 MMBtu/MWh
  - Flexibility and heat rate increase likelihood of dispatch
  - Economics are favorable based on GRDA consent letter; projected capital & operating costs
  - Base case is Wartsila 3 x 18V50SG (same as Stillwater OK, another GRDA customer)

# Key Parameters

## Reciprocating Engine Project

- Size – 56 MW (gross MW)
- Possible location – TBD
- Timing – 2016 in-service date
- Cost Estimate
  - Approximate Equipment & Installation Cost - \$55 million
  - Owner's Engineer cost - \$2.5 to 3.0 million depending on scope
  - Owner soft costs (e.g. permits, land, legal & financial, SPP studies) need further review – estimated \$2 million
  - Total cost estimate - \$60 million

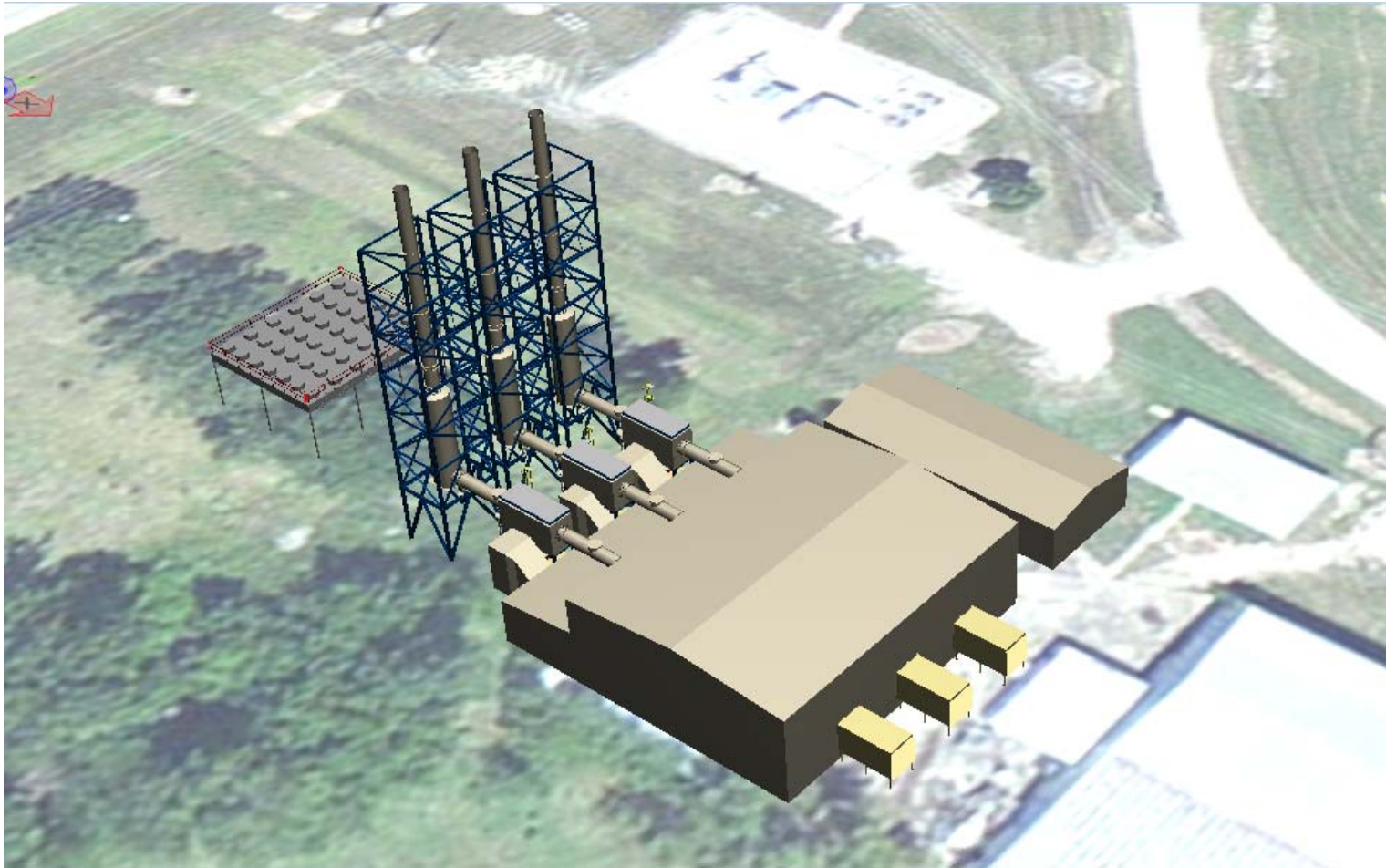
# Key Development Issues

- Rate impact – none anticipated based on GRDA consent letter
- Project financing – assumed 100% municipal bonds at cost of 3.0% to 4.25% (25 year term)
  - Bond counsel needed
- KDHE Permit to Construct (air permit)
- SPP interconnection and transmission studies may be required
  - 69-kV tie may avoid the requirement
- Gas supply – minimum 100 psig needed

# Identified Key Permitting Issues

- KDHE Air Permit – some issues may extend permitting time
  - Modeling of other local emitters
  - Restriction on allowable annual operating hours may be required

# Ariel View showing stacks and radiators



# Recommended Project Delivery System

- City as general contractor
  - Engineer works only for owner; prepares plans & specs and observes construction
  - City issues multiple bid packages for subs and equipment
    - Competitive bidding to obtain lowest cost to City
    - Avoids contractor markup on equipment
  - High level of owner control

# Schedule

- Estimated minimum project duration 24 months
  - Assumes financing will not impact project schedule
  - Includes time allowances for owner review of bid packages and awards
  - Starts from owners engineer under contract
  - Allows 10 weeks for engine selection in a formal bid
  - Air permit is a critical path activity
  - SPP interconnection process not yet evaluated
  - Project is complete after emissions and performance testing and acceptance; release for dispatch

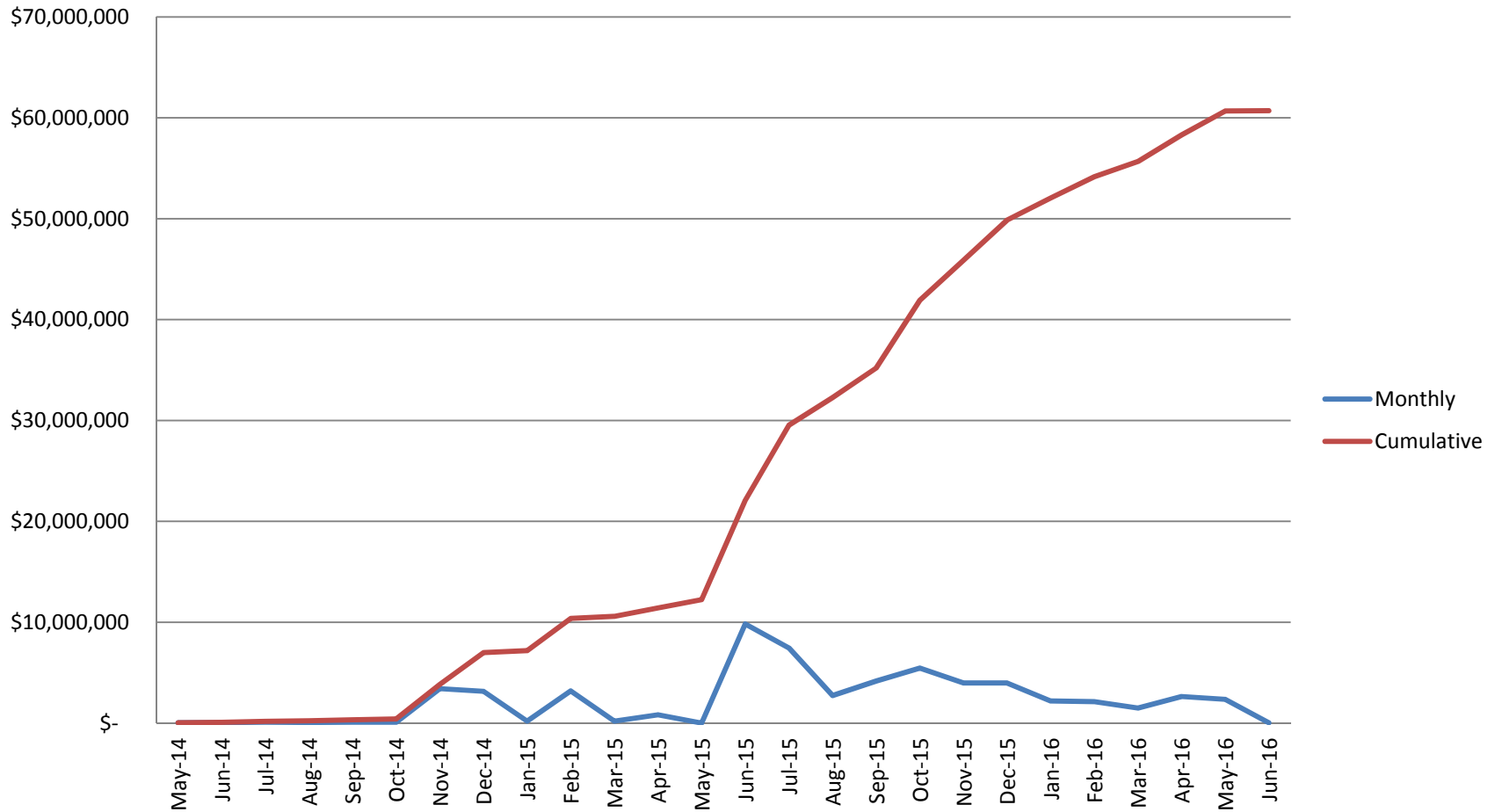


# Financing and Cash Flow (Estimated)

- GRDA capacity payment will cover debt
- GRDA variable O&M payment will cover variable O&M costs with margin
- Project estimated construction cash flow attached

# Construction Cash Flow Curve

## (Coffeyville Recip Engine Plant initial estimate)



# QUESTIONS

?