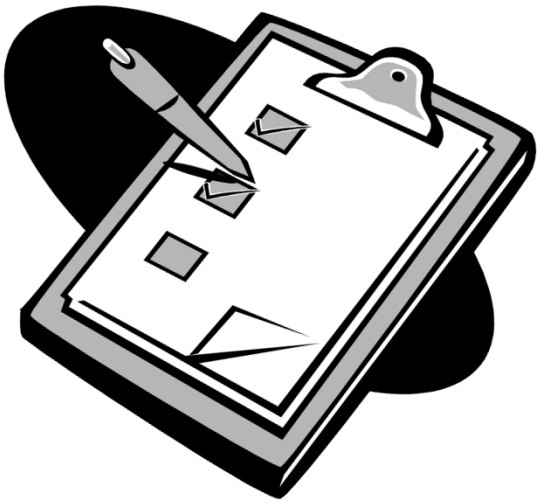
Coffeyville Municipal Light & Power
New Resource Feasibility Evaluation

September 10, 2013

Our Program - Agenda

- CMLP Overview
- Guernsey Overview
- Combined Cycle Repowering
- Gas Engine Alternative
- Experience
- Realize the Difference



Coffeyville Power Plant

Black Start Units

Avoid Interruption

Save Fuel

Reduce Maintenance

Reduces Cost

When severe weather is even a possibility the plant can be started, even if the weather doesn't happen.

Weather events, such as tornados and high winds, can not be anticipated; resulting in black start being the only method to prevent costly outages.

CMLP Units

Table 1
Summary of Existing Power Supply Resources
City of Coffeyville

Generating Unit	In Service Date	Estimated Retirement Date	Accredited Capacity MW	Forced Outage Rate Summer	Forced Outage Rate Winter	Fuel Type	Average Net Heat Rate BTU/kWh
1	2006	2036	2	N/A	N/A	Oil	9,900
2	2006	2036	2	N/A	N/A	Oil	9,900
6	1955	2025	17.647	N/A	N/A	Gas	12,200
7	1971	2031	38.235	N/A	N/A	Gas	11,200
Total			59.882				
SWPA Hydro			1.9				
Total			61.782				

Guernsey

- Employee - owned, founded in 1928
- Headquartered in Oklahoma City, OK
- Diversified Services
- Planning and Power Engineering For Electric Utilities
- High Percentage of Repeat Business
- 2012 ENR Top 5% Design Firm

guernsey
ENGINEERS
ARCHITECTS
CONSULTANTS

Project Understanding

- Scope – Combined Cycle (CC) Repowering
  - Add New General Electric 7EA
  - Repower Unit 7
  - 98.545 MW Total Capacity
  - Total Capital Costs = $85,339,970

CC Data

- An NGCC is a CT combined with a steam cycle. The hot exhaust gas from the CT passes through a heat recovery steam generator (HRSG) where it exchanges heat with water, producing steam.
- NGCCs are typically operated at either intermediate duty (20 to 65% capacity factor) or base-load (65 to 90% capacity factor).
- NGCC units with outputs of 100 MW to 800 MW achieve full-load heat rate ranges from 6,300-8,000 Btu/kWh.

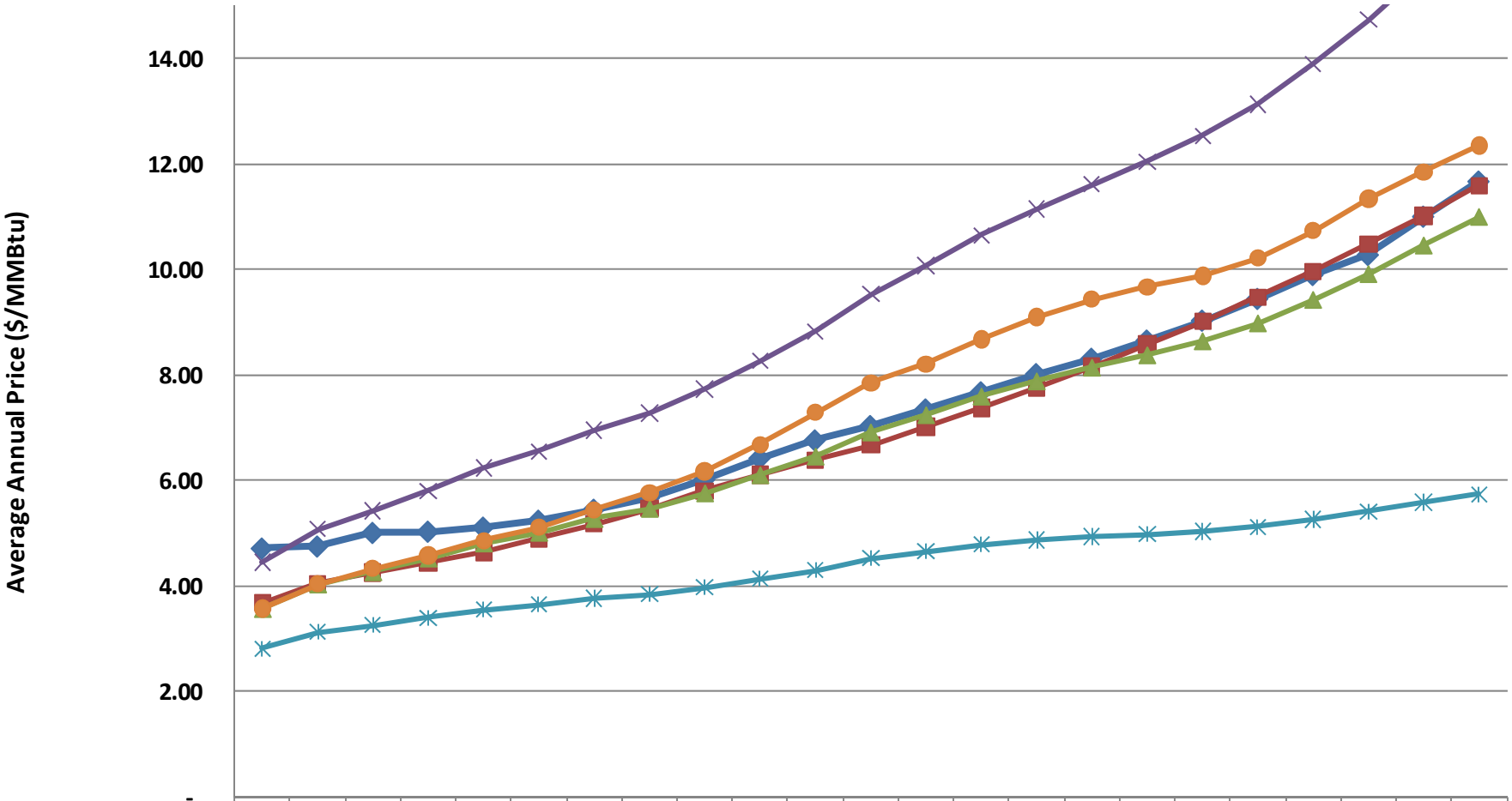
CC Repowering

- Review of existing resource costs, remaining useful life, etc.
- Review of the proposed repowering in a combined-cycle configuration.
- Review of contractual considerations under existing and proposed arrangements.
- Coordination of dispatch analysis and other feasibility analysis with GRDA.
- Summary of findings for a forecast period showing costs and benefits of the potential project and feasibility.

Major Assumption

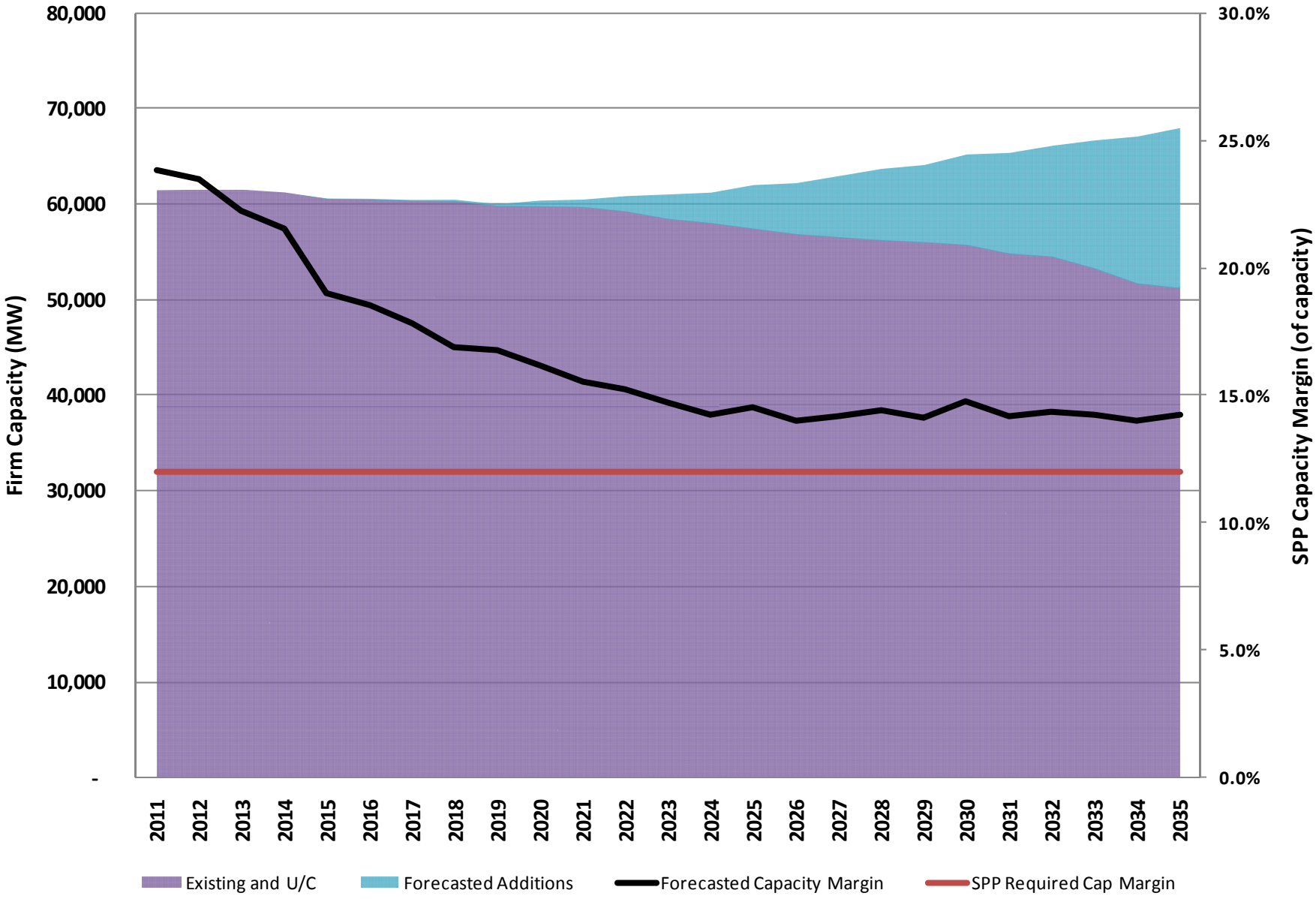
- At the beginning of the study it was understood that Guernsey would consider the economies of scale for GRDA to build a larger unit at less cost per kW than Coffeyville, and that GRDA would not pay more than it can build the unit for itself.
- It was understood the net heat rate may be less for GRDA due to its size.

Gas Forecast Comparison



	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
EIA	4.71	4.75	5.01	5.03	5.11	5.24	5.45	5.67	6.02	6.42	6.76	7.03	7.35	7.67	8.02	8.31	8.65	9.03	9.44	9.90	10.28	11.00	11.67
Nymex 2012.08.10	3.68	4.05	4.25	4.44	4.65	4.89	5.17	5.46	5.80	6.10	6.39	6.67	7.02	7.38	7.76	8.16	8.58	9.02	9.48	9.97	10.48	11.02	11.59
Ventyx Reference	3.57	4.04	4.27	4.53	4.82	5.02	5.28	5.47	5.76	6.11	6.46	6.92	7.24	7.60	7.88	8.14	8.38	8.64	8.98	9.43	9.92	10.46	11.00
Ventyx High	4.45	5.08	5.42	5.81	6.23	6.55	6.96	7.28	7.74	8.27	8.82	9.53	10.07	10.65	11.15	11.61	12.05	12.53	13.13	13.90	14.73	15.66	16.61
Ventyx Low	2.81	3.13	3.25	3.40	3.55	3.64	3.77	3.84	3.98	4.14	4.30	4.52	4.65	4.79	4.87	4.94	4.98	5.03	5.12	5.26	5.41	5.58	5.74
Ventyx Environmental	3.57	4.04	4.33	4.58	4.86	5.11	5.45	5.77	6.17	6.68	7.29	7.85	8.21	8.68	9.10	9.44	9.67	9.88	10.22	10.74	11.34	11.85	12.35

SPP Forecasted Capacity Additions



CC Analysis

- Guernsey ran Promod to evaluate the dispatch and determine the economics of the various options so that results could be analyzed.
- The revenue from a resource is therefore defined as [hourly generation] x [market price]. The expense of a resource is defined as [hourly generation] x [fuel cost plus variable O&M]. The net dollar margin is the sum of the revenue and expense. The net dollar margin will be used to offset the fixed cost to own and operate the unit and will determine the Net Cost to Own (NCO) the resource.
- Guernsey has calculated the NCO for an installation of Coffeyville owned combined cycle generation and has compared this to a combined cycle generator, which GRDA might construct, to determine the price that GRDA would be willing to pay for a new Coffeyville resource.

CC Operational Results

- CC Repowering has estimated a heat rate of 8,534 Btu/KWh which does not compare favorably to the GRDA combined cycle heat rate of 6,650 Btu/KWh.
- When dispatched in the hourly model Promod, GRDA's unit has an annual capacity factor of approximately 65%; while Coffeyville's annual capacity factor is about 8%. Based on its heat rate, the GRDA unit can be expected to operate as intended with the associated normal operation and maintenance expenses.
- The Coffeyville project would instead be operating like peaking capacity resulting in many unexpected starts and stops and greatly increasing the operations and maintenance expenses, and possibly equipment failure.

CC Repowering Summary

- Our findings suggest that a continued long-term relationship with GRDA and a modified capacity sale is marginally economical under favorable contractual arrangements.
- Major project risks include significant operational and equipment risk due to cycling the unit, future gas supply, and ongoing cash funded operation and maintenance expenses.

CC Economic Results

Table 17	
City of Coffeyville DRAFT	
Net Present Value Summary	
Summary	
Description	**NPV @ 4%**
CV NPV 2016-2031($)	(17,175,702)

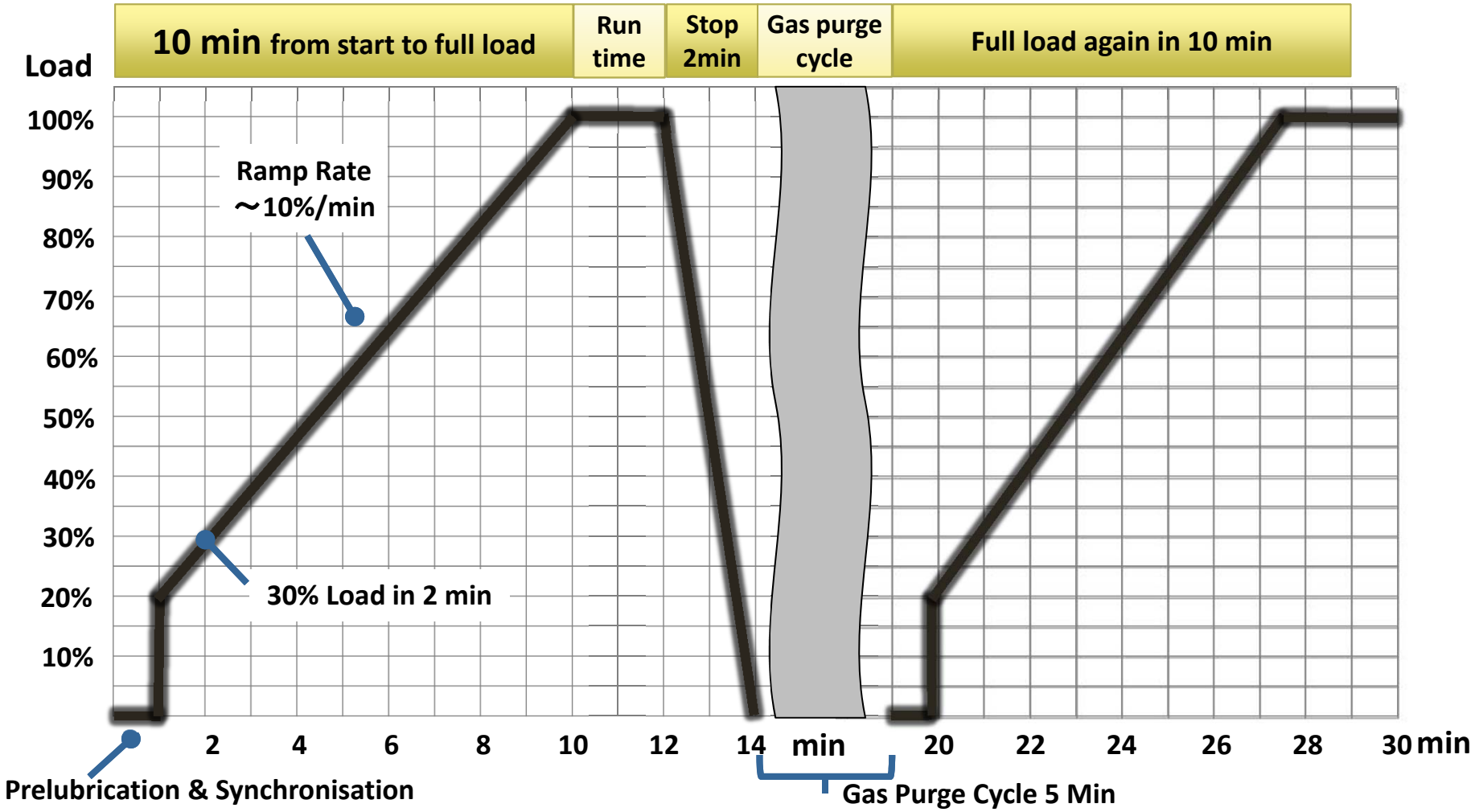
Gas Engine Generators - Project Understanding

- Evaluate 75 MW Gas Engine Generators
- **Guernsey** revised the New Resources Feasibility
- Developed construction cost estimates for project funding
- **CMLP** participation in the decision making of the study

Project Understanding

- Generation Resources Feasibility Analysis
  - Reviewed existing resource costs, remaining useful life, contractual considerations, etc.
  - Reviewed CMLP resource needs
  - Analyzed varying sizes & types of generation resources
  - Coordinated dispatch analysis & other feasibility analysis with GRDA
  - Provided summary of findings for a forecast period outlining costs & benefits

Technical Alternatives Quick start/stop: 50SG



*Engines in HOT STANDBY mode, i.e. preheated (HT water temp. >70 °C)

Summary of Results:
18.7 MW Engines

Table 10 B (Continued)

City of Coffeyville

Installation and Financing Cost

Estimated Debt Issuance	
Installed Cost ($/kW)	1,016
Installed Capacity (kW)	74,800
Total Capital Costs $	75,996,800
Bond Issuance Cost (%)	2.00%
Total Debt Issuance $	77,516,736
Fixed Charge Rate	
Interest Rate (tax-exempt bonds)	4.00%
Amortization Period (years)	28
Amortization Factor	6.00%
Renewals/Replacements	0.40%
Taxes	-
Insurance	0.20%
Capital Cost Fixed Charge Rate	6.60%
Annual Fixed Charge $	$5,117,110
$ per kW/Year	$68.41

Summary of Results

Table 20	
City of Coffeyville	
Net Present Value Summary (Without Existing Units)	
Description	**NPV @ 4%**
Annual Fixed Costs - 9.3 MW Units	86,358,463
Capacity Payment From GRDA	100,147,490
Net Benefit	13,789,027
Annual Fixed Costs - 18.7 MW Units	85,266,734
Capacity Payment From GRDA	102,217,029
Net Benefit	16,950,295

Comparison of Results

- Combined cycle not cost effective, net present value of -$17 million
- Fast start engines cost effective, net present value +$10 to $15 million
- Detailed Summary of Findings and Action Plan – Section 8 of Report
  - Maintain Existing Generation in - Like New Condition
  - Build New Generation
  - Implement Recommended Action Plan

Questions