



FMPA Solar Project

City of Alachua

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FMIPA Solar Project

Project Description

- 1. Large multi site solar project**
 - **150-225 MW is size**
 - **Located on 2-3 sites**
- 2. Maximum size for each project is 74.5 MW**
 - **Dictated by Florida's Power Plant Siting Act (PPSA)**
 - **Plants smaller than 74.5 MW do not have to be permitted under the PPSA**
- 3. Large project size results in economies of scale**
- 4. Plant technology is single axis tracking**
- 5. Probable developer is Florida Power & Light**

FMPA Solar Project

Contractual Arrangement

- 1. Developer will build, own and operate the solar plant.**
- 2. Each participating utility will be entitled to a pro rata share of plant output.**
- 3. Participating utilities will execute a Purchase Power Agreement obligating the utility to purchase the pro rata share of plant output at a specified price.**
- 4. Participating utilities will only pay for plant output, no up front costs.**

Other Participating Utilities (preliminary)

- **Orlando Utilities Comm.**
- **Kissimmee Utility Auth.**
- **Key West**
- **Ocala**
- **Bartow**
- **Winter Park**
- **Ft. Pierce**
- **Lake Worth**
- **Homestead**
- **Wauchula**

Feasibility Analysis

- ❑ Six municipal utilities retained WHH to perform a preliminary feasibility analysis
 - Alachua, Bartow, Wauchula, Ft. Meade, Winter Park and Green Cove Springs
- ❑ WHH concluded that at a PPA price of \$36 or below per MW-hr, participation in the FMPA solar Project was economically feasible (would result in savings in bulk power supply cost over the 20 year term of the project)
- ❑ Optimum level of participation level of participation would require utility specific analysis

Utility Specific Feasibility Analysis

- Alachua, among others, retained WHH to perform additional analysis specific to Alachua.
- WHH has completed the analysis the purpose of this presentation is to present the results.

Background Information

- Solar plant provides only energy not firm capacity
- Solar plant output cannot be scheduled to match electric system demand
- Solar plants require significant land area (about 7 acres per MW of plant rating)
- Proposed plants will require about 500 acres per 74.5 MW plant.

Solar Plant Savings

- Two types of potential savings
 - ❑ Energy Costs Savings
 - Difference between Solar PPA energy price and bulk power supplier price are savings
 - For example, solar PPA price may be \$34 per MW-hr, price from bulk power supplier may be \$29 per MW-hr, difference is additional cost/savings
 - ❑ Demand Costs Savings
 - About 40 % of bulk power costs are Demand Costs
 - Demand Costs are based on PEAK usage in any hour during the month
 - Since solar plant will (most likely) be producing power during this hour, demand costs will be lower.

Solar Plant Savings

- **Energy Costs Savings**
 - ❖ Negative in early years
 - ❖ Become positive as natural gas price increase
- **Demand Costs Savings**
 - ❖ Represent the bulk of savings from solar project
 - ❖ Demand savings range from 60 to 100 % of total savings
 - ❖ Demand savings are realized in every year

Economic Analysis

- WHH evaluated participation in the FMPP solar Project at levels of between 3MW and 19 MW
- System minimum load is a factor in determining optimum participation, solar participation above about 13 MW entails some additional risks.
- Analysis very dependent on future natural gas prices.
- WHH evaluated 3 natural gas price scenarios
 - 0.0% escalation, 1.3% escalation and 4.0% escalation

Results of Analysis

20 YEAR SAVINGS				
	5 MW	7 MW	9 MW	11 MW
0.0 % Gas Escalation	\$0.8 million	\$0.5 million	\$0.3 million	\$0.1 million
1.3 % Gas Escalation	\$2.0 million	\$2.3 million	\$2.6 million	\$2.8 million
4.0 % Gas Escalation	\$5.2 million	\$7.6 million	\$9.0 million	\$10.7 million

Results of Analysis

RETAIL BILL IMPACT 1,000 KW-HRS

	5 MW	7 MW	9 MW	11 MW
0.0 % Gas Escalation	-\$0.26	-\$0.17	-\$0.10	-\$0.03
1.3 % Gas Escalation	-\$0.67	-\$0.77	-\$0.87	-\$0.94
4.0 % Gas Escalation	-\$1.80	-\$2.55	-\$3.01	-\$3.59

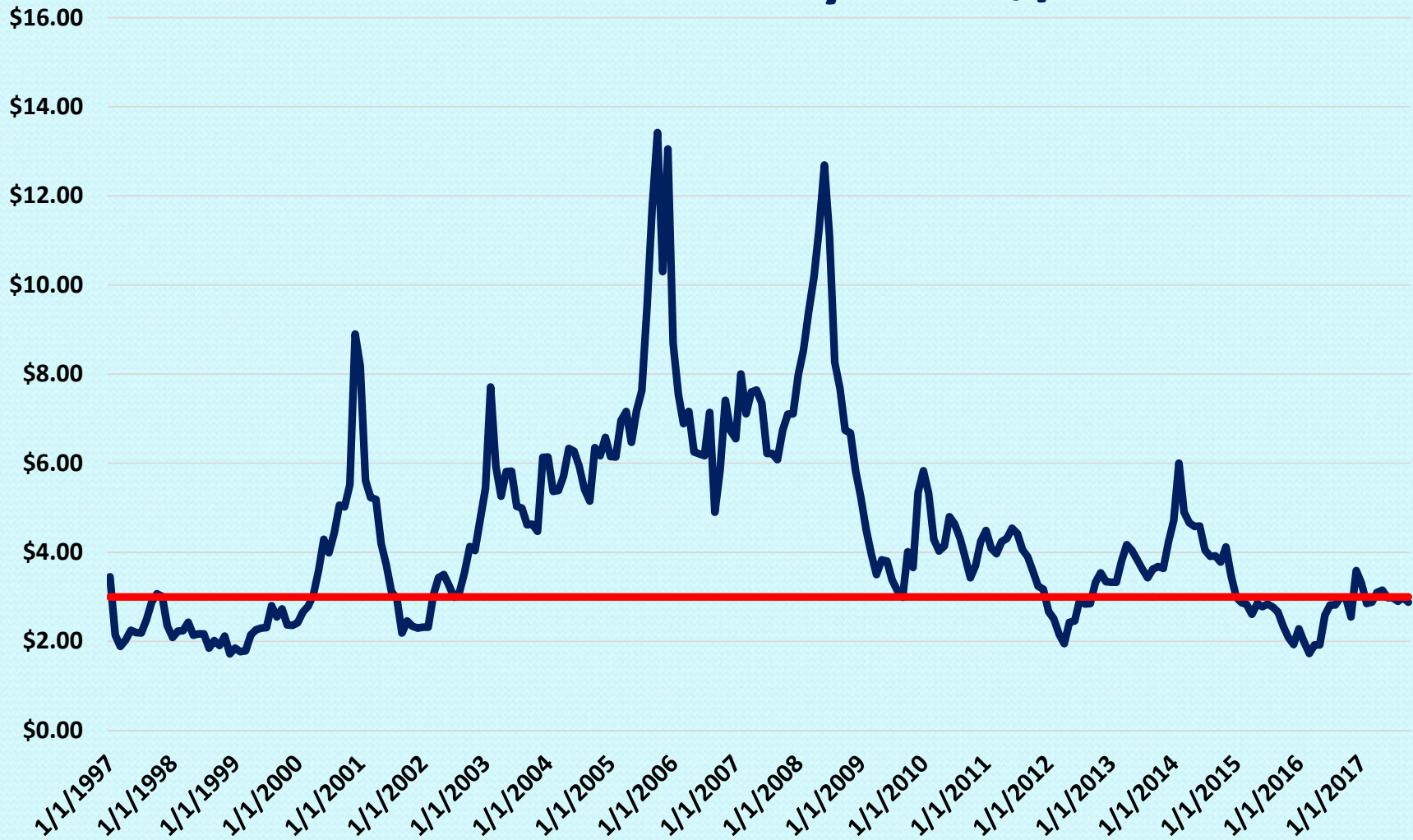
Results of Analysis

Natural Gas Escalation is the **KEY Uncertainty**

- 1. US Government projects natural gas escalation at **3.0%** 2020-2045 (AEO 2017)**
- 2. Current NYMEX futures price indicate natural gas escalation at **1.3%** (2018 thru 2029)**

Natural Gas Price History

Natural Gas Price Henry Hub \$/M²BTU



Conclusions

- 1. Participation will result in savings under all likely natural gas pricing scenarios.**
- 2. Savings are greatest with higher participation levels under most likely natural gas price scenarios.**
- 3. COA will receive REC's (Renewable Energy Credits) for all solar output.**
- 4. Participation will reduce environmental impact of bulk power supply.**
- 5. Participation at 11 MW will fix the price of approximately 15% of COA's energy requirement for the next 20 years (two 5 year extensions are available)**

Conclusions (continued)

Risks

- 1. Prices of solar plants may continue to decline (reduced opportunity to participate in future plants).**
- 2. Assumed increases in bulk power supply costs may be high; WHH assumed 2% annual increase in capacity costs.**
- 3. Savings are positively correlated with retail sales; WHH assumed 2.5 percent annual increase, reduced sales will lessen savings (not by much).**

Questions and Answers

