

**Comparing BG&E's Current Power Costs
To the Alternative of Building its Own Generating Plants**

An Independent Assessment

Abstract

This paper examines the economics of BG&E constructing a new combined cycle gas turbine generating plant, and compares the cost of electricity from the new plant with the cost of merchant power now purchased by BG&E. A strong case can be made for BG&E generating a portion of its own power needs, as the new plant generates cheaper power. The situation is essentially the same for Potomac Electric Power Company (PEPCO).

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BG&E Should Build Its Own Natural Gas-Fueled Electricity Generation

-Savings Are Substantial-

A number of Maryland's political leaders have called for re-regulating a portion of the state's electricity generation, as a means of lowering the bills for BG&E ratepayers. Alternatively, a portion of new generation might be produced under regulated returns. This study concludes that new BG&E generation plants, regulated by the Public Service Commission ("PSC") and fueled by natural gas, would save residential ratepayers 17% annually (or \$400 million) compared to current prices paid by BG&E for power.¹

Current Wholesale Power Prices Paid by BG&E

As a distribution utility, BG&E buys its power from third parties, either through the PJM network or directly through long-term contract. BG&E then sells the purchased power principally to its residential customers under standard offer service ("SOS"). BG&E's parent company, Constellation Energy Group, Inc. ("CEG"), is BG&E's largest supplier of electricity.²

In 2009 and 2008, the average cost of electricity purchased by BG&E (for resale) was \$108 and \$109 per MWh, respectively.³ For PEPCO, the corresponding costs were \$107 and \$112. The intent of this study was to determine if a new gas turbine generation plant could supply electricity at a cost less than these historical averages

Electricity Cost of New Combined Cycle Power Plant Fueled by Natural Gas

To estimate the all-in cost of generating electricity from a new combined cycle power plant fueled by natural gas, MTEF uses a roll-up number called the "Levelized Cost of Electricity." This approach includes the variable cost of generation and an apportionment of the fixed cost (including the capital cost of the power plant) over the life of the plant, assuming that the plant operates at maximum output, in every hour that it is available. The final cost of any specific power plant varies greatly depending on a number of factors including: the location in which it is built, fuel contracts, maintenance arrangements, financing arrangements, and related items. MTEF views the following numbers as good faith estimates. Lower financing costs and lower gas prices make natural gas more attractive as a fuel today, compared to past years.

¹ Purchased power accounts for about 75% of a residential customer's bill. See Exhibit A for a hypothetical savings calculation.

² The incestuous relationship between supplier and customer has a built-in conflict that harms BG&E ratepayers, as pointed out in MTEF testimony before the PSC. See Exhibit B.

³ The high cost of wholesale power hurts BG&E ratepayers, but provides high profit margins to merchant power generators such as CEG's merchant power division and Mirant Corporation. MTEF estimates that CEG's annual return on net power generation assets exceeds 20%, before the beneficial effects of leverage.

Combined Cycle Natural Gas Turbine Plant—Nominal Levelized Cost

- Capital Costs: \$17/MWh
- Fuel Cost: \$37/MWh (at \$5.50/McF gas price delivered)
- O&M Cost: \$ 3/MWh
- CO2 Allowance: \$ 3/MWh
- Net All-in Cost: \$60/MWh

The \$60 MWh levelized cost is 44% below the cost of electricity purchased by BG&E in 2008 and 2009.⁴

Discussion of Assumptions

Combined Cycle Gas Plant: A 600 MW plant costs approximately \$660 million to build. An economic life of 20 years is assumed for depreciation and debt repayment.

Financing: The calculation assumes a 50% debt/50% equity capital structure. The debt has a 5% cost and the equity a 15% cost. Both are reasonable assumptions in today's environment and reflective of the PSC's requirements for BG&E.

Gas Supply: Long-term, 10-15 year contracts for natural gas are beginning to surface in the marketplace, but the data is closely held. The Henry Hub Natural Gas Futures Market Strip (2010-2015) is one guide. It trades publicly and shows an average price of \$5.50 per McF delivered in Louisiana. A sizeable long-term deal might equal that price on a Maryland delivery basis. The attractive part of natural gas generation is that electricity demand peaks in the summer, when natural gas demand is at low ebb. Another is the fuel's relatively small environmental impact compared to coal.

Using the same estimating approach, a new supercritical coal plant (if one could be permitted today) would come in at \$75/MWh.

One thing to keep in mind is that the variable cost of gas generation, based on the above, is \$43/MWh. Any time the price of "spot" power is less than \$43, it is cheaper for BG&E to buy the power from the market rather than to generate it. While taking advantage of purchases from the market lowers the total cost of supplying power, it makes the average cost of power that comes from the gas turbine more expensive, since the fixed costs must be distributed over less energy output. For this reason, the plant's 24 hour per day assumption is important, given the service area's population of 2.3 million and the requisite base load demand.

⁴ In a perfect world, BG&E, PEPCO or the PSC might have made similar calculations for presentation to state legislators.

Recent MTEF Work on BG&E Electricity Costs

In connection with work done by Senators Pipkin and Rosapepe, MTEF developed a proposal in 2009 to have CEG provide power under long-term contract to BG&E, as a condition of the PSC approving CEG's multi-billion transaction with Electricite de France ("EDF"). Under the proposal, CEG would have sold power to BG&E at a price determined as if the related generation plants operated on a PSC regulated basis. The projected reduction in residential ratepayer electricity bills approximated 15% annually or \$300 million per year. CEG never refuted the analysis or its conclusions in a scientific manner.

As an intervener in the PSC's review of the transactions, MTEF presented the proposal in written and oral testimony. It also discussed the proposal formally in legislative testimony. The PSC approved the EDF transaction without re-regulating existing plants,⁵ and the legislature failed to advance the concept in a substantive way in 2009.

Acknowledgements

MTEF wishes to acknowledge individuals at the following organizations, who provided information or insights:

- Anadarko Petroleum (natural gas division);
- General Electric Company (gas turbine division);
- Mirant Corporation (merchant power provider); and
- PJM Interconnection (regional transmission network).

Two attempts to reach CEG and BG&E officials were unsuccessful. The Maryland PSC and Maryland Energy Administration were contacted by MTEF, but their ability to provide relevant BG&E statistical data to the public was restricted by state law.

About the MTEF

MTEF is a non profit, non partisan organization that studies budget and tax issues in the State of Maryland. Previous topics have included a \$1.1 billion legal fee requested by the Angelos law firm, a \$1.5 billion slots license giveaway proposed by the State of Maryland, Montgomery County's \$2 billion school spending and related performance, and the \$4 billion Washington Suburban Sanitary Commission (WSSC).

The website is: www.marylandtaxeducation.org.

⁵ The PSC's acquiescence to the transaction provided favorable benefits to CEG's stock price, which advanced over the last 15 months, in percentage terms, significantly more than the S&P 500 or CEG's peer group. Employees were rewarded as well, as more stock options were granted to CEG executives and employees in 2009 than in 2008 and 2007 combined. See Exhibit C.

Hypothetical Savings

Assumptions

- 600 MW combined cycle plant at full capacity provides 44% savings, compared to recent purchased power costs.
- Residential SOS bills are 75% purchased power.
- BG&E eventually obtains one-half of its generation from the new plants.

Calculation

- Savings $75\% \times 44\% \times 50\% = 17\%$ savings.

Exhibit B

BG&E

Distribution Volumes (000—MWh)

	<u>2009</u>	<u>2008</u>
Residential	12,851	13,023
Excluding Delivery Service Only:		
Commercial	3,945	3,957
Industrial	270	242
	<u>17,066</u>	<u>17,222</u>

Expenses (\$000,000)

Electricity Purchased for Resale

From Third Parties	\$ 1,217.4	\$ 1,078.1
From Affiliate	623.5	802.0
	<u>\$ 1,840.9</u>	<u>\$ 1,880.1</u>

Purchase Cost per MWh

2009	$\$1,840,900,000/17,066,000 \text{ MWh} = \$108/\text{MWh}$
2008	$\$1,880,100,000/17,222,000 \text{ MWh} = \$109/\text{MWh}$

For PEPCO, the purchased power costs (for SOS service) were \$107 per MWh in 2009 and \$112 per MWh in 2008.

CEG Stock Options

	<u>Number Granted</u>	<u>Weighted Average Exercise Price</u>	<u>Implied Value: Stock Trades at \$36 On 3-5-10</u>
2009	3,511	\$20.14	\$56 million
2008	1,434	\$93.79	-----
2007	1,759	\$76.22	-----

Note: The stock traded at \$20.14 (or less) in 2009 for only 30 days, so the timing of the stock option grants was providential for CEG executives.