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BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION
REBUTTAL TESTIMONY OF BRADLEY E. KUSHNER
ON BEHALF OF
FLORIDA MUNICIPAL POWER AGENCY
JEA
REEDY CREEK IMPROVEMENT DISTRICT
AND
CITY OF TALLAHASSEE
DOCKET NO. 060635-EU
NOVEMBER 21, 2006

Q. Please state your name and business address.

A. My name is Bradley E. Kushner. My business mailing address is 11401 Lamar Avenue, Overland Park, Kansas 66211.

Q. By whom are you employed and in what capacity?

A. I am employed by Black & Veatch Corporation. My current position is Senior Consultant/Project Manager.

Q. Have you previously submitted testimony in this proceeding.

A. Yes.

Q. Have you reviewed the testimony of Dian Deevy that was filed in this docket on November 2, 2006?

1 A. Yes, I have.

2

3 **Q. Have you reviewed the testimony of Dale Bryk that was filed in this docket**
4 **on November 2, 2006?**

5 A. Yes, I have.

6

7 **Q. Have you reviewed the testimony of Hale Powell that was filed in this**
8 **docket on November 3, 2006?**

9 A. Yes, I have.

10

11 **Q. Have you reviewed the testimony of Stephen A. Smith that was filed in this**
12 **docket on November 2, 2006?**

13 A. Yes, I have.

14

15 **Q. What is the purpose of your rebuttal testimony?**

16 A. The purpose of my testimony is to address several assertions in the testimony of
17 Dr. Stephen A. Smith, Mr. Dale Bryk, Mr. Hale Powell and Ms. Dian Deevy.
18 Specifically, in response to Dr. Smith's assertions regarding increasing
19 construction costs for coal-fired power plants, I will show that even in light of
20 the updated capital cost estimate for the Taylor Energy Center (TEC) (discussed
21 in the rebuttal testimony of Paul Hoornaert) TEC remains the most cost-
22 effective alternative for all of the Participants. I will rebut the claims by Mr.
23 Bryk that DSM, biomass, and IGCC were not evaluated in the TEC Need for
24 Power Application, Exhibit No. ___ (TEC-1). In response to Dr. Smith's

1 testimony, I also will discuss Tallahassee's recently signed contract with BG&E
2 and will address his claims that a 75 MW share of TEC should have been
3 evaluated for the City. I also will show that participation in TEC will not
4 necessarily have an adverse impact on the City's rates. I will rebut Mr. Powell's
5 claims that demand side management (DSM) was not adequately evaluated nor
6 detailed in the TEC Need for Power Application, and will show that even in
7 light of the updated capital cost estimate for TEC and the potential for higher
8 fuel costs that DSM will still not be cost-effective.

9

10 **Q. Are you familiar with the updated capital cost estimate discussed in the**
11 **rebuttal testimony of Paul Hoornaert in response to Dr. Smith's assertions**
12 **regarding increasing construction costs of coal-fired power plants?**

13 A. Yes.

14

15 **Q. Is TEC still the most cost-effective alternative for each of the Participants**
16 **when considering the updated TEC capital cost estimate?**

17 A. Yes. TEC is still the least-cost alternative for each of the Participants. The
18 updated capital cost estimate discussed in Mr. Hoornaert's rebuttal testimony
19 represents approximately a 19 percent increase compared to the capital cost
20 estimate for TEC presented in Table A.3-5 of Volume A of the TEC Need for
21 Power Application. One of the sensitivity analyses performed for each
22 Participant contemplated a 20 percent increase in capital costs and showed that
23 TEC is the most cost-effective alternative for each Participant. This sensitivity
24 analysis is presented in Section 6.0 of Volumes B through E of the Need for

1 Power Application, and summarized in Exhibit No. ___ (BEK-3) of my direct
2 testimony.

3
4 The updated TEC capital cost estimate is within the 20 percent used for the high
5 capital cost sensitivity and, as discussed in the rebuttal testimony of Chris
6 Klausner, it is appropriate to apply this same magnitude (20 percent) capital cost
7 increase to the coal-fired circulating fluidized bed (CFB) alternatives considered
8 for each Participant because CFB units would be subject to similar market
9 influences as those that resulted in the updated TEC capital cost estimate.

10 Although the natural gas alternatives would likely experience a smaller
11 percentage capital cost increase, the next lowest cost alternative capacity
12 expansion plans without TEC for Florida Municipal Power Agency (FMPA),
13 JEA, and the City of Tallahassee include CFBs. For that reason, the relative
14 economics of participation in TEC for each Participant will not be affected by
15 the updated TEC capital cost estimate. The results of the high capital cost
16 sensitivity may be translated directly to the other sensitivity scenarios presented
17 in the TEC Need for Power Application because the updated capital cost
18 estimate for TEC will not affect the balance of system production costs. Thus,
19 all the plans with TEC in the sensitivity analyses will remain the most cost-
20 effective with the increase in capital costs.

21

22 **Q. Would either of Southern Company's proposals received in response to the**
23 **Participants Request for Proposals (RFP) be more cost-effective than TEC**
24 **when considering the updated capital cost estimate?**

1 A. No. TEC remains more cost-effective than either of Southern Company's
2 proposals.

3

4 **Q. On page 7 of his testimony, Mr. Bryk suggests that DSM was not “fully**
5 **explored” by all of the Participants. Do you agree with Mr. Bryk’s**
6 **suggestion?**

7 A. No. The cost-effectiveness of DSM was appropriately considered for each
8 Participant.

9

10 **Q. Please explain how DSM was considered in the analysis for each**
11 **Participant.**

12 A. The Commission-approved Florida Integrated Resource Evaluator (FIRE) model
13 was used for the DSM evaluations for FMPA and JEA. The City of
14 Tallahassee's DSM evaluation was based on a utility-specific approach that the
15 City developed as part of its ongoing integrated resource planning effort. The
16 City's approach, with which Mr. Bryk does not take exception, is based on
17 projections of total achievable energy and capacity reductions and their
18 associated annual costs developed specifically for the City of Tallahassee. A
19 renewed evaluation of the potential cost-effectiveness of DSM for Reedy Creek
20 Improvement District (RCID) was not performed as discussed in the direct
21 testimony of Nicholas Guarriello because RCID's customers have already
22 applied all reasonably available conservation measures and will continue to
23 install conservation measures, as appropriate, in the future.

24

1 **Q. How many potential DSM measures were evaluated using the FIRE model**
2 **for FMPA and JEA?**

3 A. Approximately 180 potential DSM measures were evaluated for both FMPA and
4 JEA, encompassing DSM measures that target both residential and commercial
5 customers.

6
7 **Q. How is the cost-effectiveness of DSM measures evaluated by the FIRE**
8 **model?**

9 A. The FIRE model requires three main sources of input. The first is the
10 characterization of the DSM and conservation measures which includes the
11 detailed cost and kWh and kW savings of the measure. The second is the cost
12 and characteristics of the unit to be avoided with the DSM and conservation,
13 which in this case is participation in TEC. Finally, utility system specific
14 information such as rates is required with separate rates used depending on the
15 customer class each measure pertains to.

16
17 The FIRE model provides three tests designed to measure the cost-effectiveness
18 of DSM and conservation from different perspectives, including the Total
19 Resource Test, the Participant Test, and the Rate Impact Test.

20
21 If the benefit-to-cost ratio of these tests is greater than 1.0, then the DSM and
22 conservation measures are cost-effective under the test. Consistent with the
23 Commission's past actions, both FMPA and JEA relied on the Rate Impact Test
24 for their determination of cost-effectiveness of DSM and conservation measures.

1 The FPSC has also consistently found the Rate Impact Test to be appropriate for
2 determining cost-effectiveness.

3
4 **Q. Were any DSM measures determined to be cost-effective for either FMPA
5 or JEA?**

6 A. No. None of the additional measures considered by FMPA or JEA had a Rate
7 Impact Test score greater than 1.0. Thus, none of the additional DSM or
8 conservation measures were found to be cost-effective. Consideration of the
9 TEC capital cost estimate discussed in the rebuttal testimony of Paul Hoornaert
10 does not change these conclusions.

11
12 **Q. Is the scope and methodology of the DSM evaluation presented in this
13 docket on behalf of FMPA and JEA consistent with previous DSM
14 evaluations presented to and approved by the Florida Public Service
15 Commission?**

16 A. Yes. Evaluations using the same or similar methodology were presented to and
17 approved by the Commission in the need determination proceeding regarding
18 FMPA's Treasure Coast Energy Center Unit 1 Need for Power Application
19 (Docket 050256-EM) and in the need determination proceeding for Orlando
20 Utilities Commission's Stanton Energy Center Unit B Need for Power
21 Application (Docket No. 060155-EM). The Commission approved those need
22 applications in Order No. PSC-05-0781-FOF-EM (July 2005) and Order No.
23 PSC-06-0457-FOF-EM (May 2006), respectively. I personally oversaw the

1 DSM evaluations in those proceedings and presented the results in testimony
2 filed with the Commission.

3
4 **Q. Mr. Powell's testimony suggests that the Need for Power Application does**
5 **not provide sufficient detail to assess the Participant's DSM cost-**
6 **effectiveness evaluations. Do you agree?**

7 A. No. Section 7.0 of Volumes B and C discuss each of the 180 DSM measures
8 considered in the analysis, as well as the methodology utilized and results of the
9 cost-effectiveness evaluations. The level of detail provided in the TEC Need
10 for Power Application is consistent with, if not greater than, that presented in the
11 afore-mentioned Docket No. 050256-EM and Docket No. 060155-EM, which
12 the Commission found to be appropriate. Due to the volume of material
13 comprising the input and output of the FIRE model (i.e. thousands of pages), it
14 was not practical to file all the supporting background materials with the Need
15 for Power Application.

16
17 **Q. How were the various DSM measures selected for evaluation?**

18 A. The DSM measures evaluated in the FIRE model were chosen to represent a
19 wide range of various end-use measures across residential and commercial
20 customer classes, and also differentiate between existing and new construction.
21 The DSM measures also are consistent with those evaluated in previous dockets
22 as discussed above.

23

1 **Q. Are the end-uses, customer classes, and differentiation between existing and**
2 **new construction delineated in the TEC Need for Power Application?**

3 A. Yes. The descriptions of the DSM measures in Section 7.0 of Volumes B and C
4 identify the end-use and customer class of each measure, as well as whether
5 each measure targets existing or new construction. Further, the tables presented
6 at the end of Section 7.0 of Volumes B and C reiterate these parameters.

7

8 **Q. The testimony of Hale Powell (Page 19) states that achievable cost-effective**
9 **potential DSM ranges from 9 percent to 24 percent. Do you believe this is**
10 **an appropriate range?**

11 A. Dr. Powell does not identify the “nine studies” he relied upon in calculating that
12 range. It is impossible to assess this range of cost-effective DSM potential
13 without reviewing the studies that Powell references. For comparison purposes,
14 Florida Power & Light Company (FPL), which has the largest demand savings
15 from conservation of any utility in the United States, has realized demand and
16 energy savings of 12 percent and 4 percent, respectively as presented in their
17 2006 Ten-Year Site Plan.

18

19 **Q. The testimony of Hale Powell (Page 17) states that even if only 50 percent of**
20 **a DSM program is completed it will provide energy savings over the useful**
21 **life of the DSM measure. Do you agree with that statement?**

22 A. Not necessarily. Some DSM programs lose their energy savings over time.
23 Good examples of this are compact fluorescents which sometimes get replaced
24 before the end of their life with incandescents due to customer dissatisfaction

1 with delay when they are turned on or the difference in the color of the light.
2 Another example is low flow shower restrictors that are sometimes removed
3 because the customer does not like the reduced water flow. Besides the above
4 examples, another important point associated with Mr. Powell's comment is the
5 cost-effectiveness of the DSM program. If the planned DSM expenditures are
6 made and the program only achieves half of the penetration, then the program is
7 twice as costly as planned. Likewise, if the DSM savings are half of what was
8 planned, the program is twice as costly as planned.

9
10 **Q. On page 5 of his testimony, Dr. Smith indicates that the Applicant's did not**
11 **identify the DSM/conservation programs in place by FMPA's All**
12 **Requirements Project members. Do you agree?**

13 A. No. The DSM/conservation programs in place by FMPA's All Requirements
14 Project (ARP) members are presented and described in Section B.7.1 of the
15 Need for Power Application entitled *Existing DSM and Conservation Programs*.
16 To encourage ARP members to offer their customers DSM and conservation
17 measures, FMPA also provides price signals that are properly designed to
18 provide incentives to lower on-peak demand.

19
20 **Q. On page 5 of his testimony, Dr. Smith suggests that the DSM cost-**
21 **effectiveness analysis for FMPA was somehow flawed because members of**
22 **FMPA's All Resources Project have joined together for power supply**
23 **purposes. Do you agree with that suggestion?**

1 A. No. As a wholesale supplier of electric energy to its members, FMPA is not
2 directly responsible for DSM programs. Nevertheless, as discussed in Section
3 B.7.0 of the TEC Need for Power Application, FMPA evaluated the cost-
4 effectiveness of 139 commercial/industrial DSM measures and 41 residential
5 DSM measures using the Commission-approved FIRE model. The DSM cost-
6 effectiveness analysis performed for FMPA in this case is fully consistent with
7 the DSM cost-effectiveness analysis which I performed and sponsored for
8 FMPA in its recent Need for Power Application for the Treasure Coast Energy
9 Center. As noted above, the Commission approved the Treasure Coast Project
10 last July in Order PSC-05-0781-FOF-EM.

11

12 **Q. On Page 7 of his testimony, Dale Bryk suggests that a biomass supply-side**
13 **resource alternative was not “fully explored” by each Participant. Has each**
14 **Participant appropriately considered biomass resources?**

15 A. Yes. A sensitivity analysis was performed for each Participant that included 30
16 MW of conventional direct fired biomass capacity in their portfolio of supply-
17 side additions. The results of these analyses are summarized in Section 6.0 of
18 Volumes B through E of the TEC Need for Power Application, and are also
19 presented in Exhibit No.__(BEK-3) of my direct testimony. The results of these
20 sensitivity analyses indicate that biomass in lieu of TEC is not a cost-effective
21 for any of the Participants.

22

23 **Q. Are you familiar with the contract the City of Tallahassee recently entered**
24 **into to purchase 38 MW of biomass from BG&E?**

1 A. Yes.

2

3 **Q. On page 4 of his testimony, Dr. Smith suggests that in light of the City of**
4 **Tallahassee’s new contract with BG&E, “[b]iomass clearly can be a viable**
5 **alternative to the proposed coal plant.” Do you agree with that suggestion?**

6 A. No. The City of Tallahassee’s contract with BG&E is for a synthetic gas
7 biomass unit that would be the first of its kind in commercial operation. In
8 recognition of the developmental status of the proposed biomass unit, and based
9 on its own assessment of the cost savings that could be realized under the power
10 purchase agreement, the City has structured its contract with BG&E to be based
11 on payments on an energy basis when it is delivered from the unit. The rebuttal
12 testimony of Ryan Pletka discusses the BG&E contract in more detail and
13 whether biomass can be a viable alternative to TEC. Black & Veatch’s analysis
14 of the conventional direct fired biomass unit for the City of Tallahassee as
15 discussed in Section E.6.2.5 of Volume E of the Need For Power filing indicates
16 that the cumulative present worth cost over the planning period would increase
17 \$25.5 million with the conventional direct fired biomass unit as compared to the
18 plan that did not include a conventional direct fired biomass unit.

19

20 **Q. Is the BG&E biomass resource for which the City of Tallahassee contracted**
21 **more cost-effective than TEC?**

22 A. When analyzed using the consistent set of assumptions in this Need For Power
23 Application, TEC is more cost-effective than the BG&E biomass resource. The
24 30-year levelized cost of energy from Tallahassee’s contract with BG&E is

1 approximately \$79.12/MWh. The 30-year levelized cost for TEC, incorporating
2 the updated capital cost estimate for TEC discussed in the rebuttal testimony of
3 Paul Hoornaert and including sulfur dioxide (SO₂), nitrogen oxides (NO_x), and
4 mercury emission allowance prices, is approximately \$65.50/MWh. For
5 informational purposes, consideration of the fuel and emission allowance prices
6 corresponding to Hill & Associates' hypothetical, carbon dioxide (CO₂)
7 regulated scenario as well as the updated TEC capital cost estimate results in the
8 30-year levelized cost for TEC of approximately \$74.05/MWh, which is still
9 less than the levelized cost of the BG&E biomass contract. Further, TEC will
10 provide a reliable source of capacity, whereas the City of Tallahassee has
11 recognized that BG&E may not be a reliable capacity resource in their biomass
12 contract.

13
14 **Q. On page 9 of his testimony, Mr. Bryk suggests that the Participants must**
15 **“realistically evaluate (in light of CO₂-related cost implications and other**
16 **factors) the relative benefits of natural gas-fired generation and the benefits**
17 **of IGCC technology.” Did your analysis consider natural gas-fired**
18 **generation alternatives?**

19 **A.** Yes. We included an alternative of a 3x1 natural gas-fired combined cycle unit
20 instead of TEC in our analysis.

21
22 **Q. Was natural gas-fired generation found to be a cost-effective alternative to**
23 **TEC when the cost of CO₂ allowances are considered?**

1 A. No. TEC remains the most cost-effective alternative under the hypothetical
2 regulated-CO₂ scenario.

3

4 **Q. Did your analysis consider integrated gasification combined cycle (IGCC)**
5 **alternatives?**

6 A. Yes. A 1x1 IGCC alternative was considered for FMPA, JEA, and the City of
7 Tallahassee. Each of the Participants also evaluated a joint-development IGCC
8 alternative to participation in TEC.

9

10 **Q. Was IGCC found to be a cost-effective alternative to TEC?**

11 A. No.

12

13 **Q. On page 7 of his testimony, Dr. Smith asserts that approval of TEC would**
14 **result in “significant rate impacts” for the City of Tallahassee. How will**
15 **participation in TEC impact rates for the City of Tallahassee’s electric**
16 **customers?**

17 A. Rate impact analysis is a complex undertaking and involves consideration of
18 other factors not considered in this Need for Power Application, such as cost
19 allocations among customer classes, allocation of fixed versus variable costs
20 among classes, existing debt service, and other rate design considerations.

21 However, the economic analysis indicates that TEC will provide annual savings
22 to the City of Tallahassee. Tables E.5-5 and E.5-6 of Section E.5.0 of the TEC
23 Need for Power Application illustrate that the total annual system costs for the
24 capacity expansion plan including TEC are lower than the total annual system

1 costs for the capacity expansion plan not including TEC every year beginning in
2 2012 and extending through the evaluation period. Lower system costs generally
3 translate to lower overall rates.
4

5 **Q. On page 4 of his testimony, Dr. Smith states that the City would benefit**
6 **more from owning 75 MW than the proposed 20.3 percent of TEC. Can**
7 **you address this statement?**

8 A. The conclusion that reducing their ownership share of TEC to 75 MW would
9 provide an economic benefit to the City is not entirely accurate. The
10 presentation by City utility staff that Dr. Smith is referring to included the
11 results of a multi-variable risk analysis which indicated that owning 75 MW
12 instead of 20.3 percent (approximately 155 MW) may potentially provide lower
13 cost risk and therefore could represent an economic benefit. That same
14 presentation indicated that ownership of 155 MW of TEC would be more
15 economic (achieve a higher level of probability weighted cost savings) for the
16 City than reducing their ownership share to 75 MW.
17

18 **Q. Page 8 of Powell's testimony contemplates the impact of higher than**
19 **expected emission allowance prices. How would higher than expected**
20 **emission allowance prices affect the cost-effectiveness of TEC for each**
21 **Participant?**

22 A. Section 6.0 of Volumes B through E of the TEC Need for Power Application
23 presents a sensitivity scenario in which emissions annual allowance prices are
24 increased by 25 percent above the annual base case emission allowance price

1 forecasts. TEC was found to be cost-effective for each of the Participants under
2 this high emission allowance price sensitivity.

3

4 **Q. Page 8 of the testimony of Powell also theorizes that DSM would be more**
5 **cost-effective under scenarios in which fuel prices are higher than expected.**
6 **Has any analysis been performed to determine if DSM is cost-effective in a**
7 **scenario in which fuel prices are higher than expected?**

8 A. Yes. The DSM cost-effectiveness analysis has been performed for FMPA and
9 JEA using the high fuel price sensitivity scenario. The results of this analysis
10 indicate that no DSM measures pass the Rate Impact Test for either FMPA or
11 JEA.

12

13 Similarly, the DSM cost-effectiveness analysis has been performed for FMPA
14 and JEA using the regulated-CO₂ sensitivity scenario. The results of this
15 analysis indicate that no DSM measures pass the Rate Impact Test for either
16 FMPA or JEA.

17

18 **Q. On Page 8 of her testimony, Dian Deevy states that Synapse Energy**
19 **Economics was responsible for an evaluation of potential CO₂ compliance**
20 **costs for the City of Tallahassee. Ms. Deevy further states that Synapse's**
21 **estimates should have been used by all of the Participants. Why were**
22 **Synapse's CO₂ allowance price projections not considered in the TEC Need**
23 **for Power Application?**

24

1 A. The CO₂ allowance price projections presented in the TEC Need for Power
2 Application were developed by Hill & Associates, and were therefore consistent
3 with the parameters and assumptions used in developing their fuel forecasts.
4 Thus, it is appropriate to use Hill & Associates' CO₂ allowance price projections
5 in the base case rather than introduce a forecast of CO₂ allowance prices that is
6 decoupled from the overall fuel price forecasts, which is the case when using
7 Synapse's projections.

8

9 **Q. Does this conclude your testimony?**

10 A. Yes.

11