

ORIGINAL

BEFORE THE
FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NO. 07 _____ -EI
IN RE: TAMPA ELECTRIC'S
PETITION TO DETERMINE NEED FOR
POLK POWER PLANT UNIT 6

TESTIMONY AND EXHIBIT
OF
ALAN S. TAYLOR
ON BEHALF OF
TAMPA ELECTRIC COMPANY

DOCUMENT NUMBER-DATE

06178 JUL 20 18

FPSC-COMMISSION CLERK

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BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION
PREPARED DIRECT TESTIMONY
OF
ALAN S. TAYLOR
ON BEHALF OF
TAMPA ELECTRIC COMPANY

Q. Please state your name, business address, and employer.

A. My name is Alan S. Taylor, and my business address is 5511 Northfork Court, Boulder, Colorado, 80301.

Q. By whom are you employed and what position do you hold?

A. I am President of Sedway Consulting, Inc.

Q. Please describe your duties and responsibilities in that position.

A. I perform consulting engagements in which I assist utilities, regulators, and customers with the challenges that they may face in today's dynamic electricity marketplace. My area of specialization is in electric generating resource procurement and the economic and financial analysis of power supply options.

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1 Q. Please describe your education and professional
2 experience.

3
4 A. I earned a Bachelor of Science Degree in Energy
5 Engineering from the Massachusetts Institute of
6 Technology and a Masters Degree in Business
7 Administration from the Haas School of Business at the
8 University of California, Berkeley, where I specialized
9 in finance and graduated valedictorian.

10

11 I have worked in the utility planning and operations area
12 for over 20 years, predominantly as a consultant
13 specializing in integrated resource planning, competitive
14 bidding analysis, utility industry restructuring, market
15 price forecasting, and asset valuation. I have testified
16 before state commissions in proceedings involving
17 resource solicitations, environmental surcharges, and
18 fuel adjustment clauses.

19

20 I began my career at Baltimore Gas & Electric Company,
21 where I performed efficiency and environmental compliance
22 testing on the utility system's power plants. I
23 subsequently worked for five years as a senior consultant
24 at Energy Management Associates ("EMA", now New Energy
25 Associates), training and assisting over two dozen

1 utilities in their use of EMA's operational and strategic
2 planning models, PROMOD III and PROSCREEN II. During my
3 graduate studies, I was employed by Pacific Gas &
4 Electric Company, where I analyzed the utility's proposed
5 demand side management ("DSM") incentive ratemaking
6 mechanism, and by Lawrence Berkeley Laboratory, where I
7 evaluated utility regulatory policies surrounding the
8 development of brownfield generation sites.

9
10 Subsequently, I worked at PHB Hagler Bailly (and its
11 predecessor firms) for ten years, serving as a vice
12 president in the firm's Global Economic Business Services
13 practice and as a senior member of the Wholesale Energy
14 Markets practice of PA Consulting Group, when that firm
15 acquired PHB Hagler Bailly in 2000. In 2001, I founded
16 Sedway Consulting, Inc. and have continued to specialize
17 in economic analyses associated with electricity
18 wholesale markets.

19
20 **Q.** What is the purpose of your testimony?
21

22 **A.** I was retained to assist Tampa Electric Company ("Tampa
23 Electric") in conducting its 2007 solicitation for
24 competitive power supplies. The purpose of my testimony
25 is to describe my role as an independent evaluator and

1 present my findings. I reviewed Tampa Electric's
2 solicitation process and stood ready to perform a
3 parallel and independent economic evaluation of Tampa
4 Electric's Planned Base Load Unit ("PBLU") and any
5 proposals that might be submitted in response to the
6 utility's 2013 Base Load Generation Capacity Request for
7 Proposals ("RFP"). Tampa Electric's PBLU is Polk Unit 6,
8 a 632 MW integrated gasification combined cycle
9 generating facility that will be located at Tampa
10 Electric's existing plant site in Polk County, Florida.

11
12 I concluded that Tampa Electric ran a reasonable
13 solicitation and that the RFP was a reasonable document
14 for soliciting power supply proposals.

15

16 **Q.** Are you sponsoring an exhibit in this case?

17

18 **A.** Yes, I sponsor Exhibit No. ____ (AST-1), Resume of Alan
19 S. Taylor.

20

21 **Q.** Please describe the role you performed as an independent
22 evaluator in Tampa Electric's solicitation.

23

24 **A.** I reviewed Tampa Electric's 2007 Ten Year Site Plan and
25 participated in the development of the utility's 2013

1 Base Load Capacity RFP. I provided suggestions for
2 refinements that Tampa Electric incorporated into its
3 final document. I attended the company's RFP Bid
4 Workshop in Tampa on February 21, 2007.

5
6 Before the proposal due date, I requested that Tampa
7 Electric run its resource evaluation model, PROMOD, and
8 provide production costing results that I could use to
9 calibrate Sedway Consulting's proprietary resource
10 evaluation model, its Response Surface Model ("RSM"). I
11 flew to Tampa to be available to oversee and participate
12 in the opening of proposal packages. As it turned out,
13 no proposals were submitted. Had there been any
14 proposals, I would have retained one copy of each
15 submitted proposal and evaluated the economic/pricing
16 information from each proposal, using the RSM to
17 independently analyze and rank the proposals relative to
18 Tampa Electric's PBLU.

19
20 **Q.** How were you involved in the development of the RFP?

21
22 **A.** As the independent evaluator, I reviewed draft versions
23 of the RFP document, participated in several discussions
24 by phone, and was given the opportunity to provide input
25 and suggestions for improving the RFP, which Tampa

1 Electric did incorporate into the document. For example,
2 I recommended that Tampa Electric reduce the minimum
3 resource size specified in the RFP (from 150 MW down to
4 75 MW) to encourage broader participation. With a lower
5 minimum size, smaller projects could be eligible. In
6 addition, larger projects that were less than 600 MW and
7 otherwise would not meet the RFP's total resource
8 requirement on their own could be packaged and
9 supplemented with small projects to meet the RFP's 600 MW
10 target.

11
12 I was also consulted about the development and issuance
13 of a draft power purchase agreement ("PPA"). While the
14 RFP itself included a reasonable description of the key
15 parameters that Tampa Electric wished to include in a
16 potential business transaction, it did not include a
17 draft PPA. Some utility RFPs have included a draft PPA
18 so that the utility's starting position was clear on the
19 contemplated transaction. Although I encouraged Tampa
20 Electric to consider including a draft PPA with the
21 issuance of its RFP, I concurred with its ultimate
22 decision to list the critical requirements of a PPA in
23 its RFP and defer the issuance of a PPA until bidders
24 were short listed. The draft PPA available at the time
25 of issuance did not contain the language necessary to

1 consider each possible response. By waiting to issue a
2 revised PPA or PPAs to short listed bidders, Tampa
3 Electric could be sure to craft documents that
4 corresponded with the types of resources on the short
5 list. Indeed, I have seen several solicitations where
6 draft PPAs were not released until short listing. Also,
7 this has the advantage of making the RFP a little more
8 inviting because it does not require the legal effort and
9 expense of a bidder having to mark up a draft PPA as part
10 of his or her initial proposal.

11
12 **Q.** Do you believe that Tampa Electric's RFP was a reasonable
13 document for soliciting proposals?

14
15 **A.** Yes. As one who has developed over a dozen such utility
16 resource RFPs, I believe that Tampa Electric's RFP struck
17 a good balance between being sufficiently detailed
18 without being burdensome on the bidder.

19
20 **Q.** Do you believe that Tampa Electric's solicitation
21 provided sufficient information to allow bidders to
22 develop good proposals?

23
24 **A.** Yes. I believe that the RFP contained sufficient
25 information and instructions. Also, Tampa Electric made

1 the RFP available through a specific page of its company
2 website that was dedicated to the solicitation. This
3 website included instructions for potential bidders to
4 submit questions about the RFP. In addition, Tampa
5 Electric held a Bid Workshop in Tampa on February 21,
6 2007 to provide potential bidders an opportunity to ask
7 questions and learn more about the RFP - either in person
8 or via a teleconferencing line.

9
10 **Q.** You mentioned that no proposals were submitted in
11 response to Tampa Electric's RFP. Why were no proposals
12 submitted?

13
14 **A.** I do not know; I can only speculate. I presume that the
15 economics of Tampa Electric's PBLU, particularly
16 considering the award of \$133.5 million of tax credits,
17 made the resource so cost-effective that many potential
18 suppliers believed that their marketing efforts would be
19 better directed toward opportunities elsewhere. As
20 required the RFP included a significant amount of
21 economic and financial information about Tampa Electric's
22 PBLU. Thus, potential bidders were able to analyze the
23 economics of the PBLU and determine whether or not they
24 could offer a competitive alternative.

25

1 Q. What do you conclude about Tampa Electric's solicitation?

2

3 A. I conclude that Tampa Electric issued a reasonable RFP
4 and followed a reasonable process for soliciting power
5 supply proposals that might be better than Tampa
6 Electric's PBLU. The RFP was sufficiently detailed to
7 provide the necessary information to potential bidders.
8 The economic evaluation methodology and key assumptions
9 were included in the RFP, and potential bidders were
10 provided sufficient opportunities to ask questions or
11 obtain clarifications about the RFP requirements.

12

13 Q. Does this conclude your testimony?

14

15 A. Yes.

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RESUME OF ALAN S. TAYLOR

AREAS OF QUALIFICATION

Competitive bidding resource selection, integrated resource planning, market analysis, risk assessment, and strategic planning

EMPLOYMENT HISTORY

- ◆ President, Sedway Consulting, Inc., Boulder, CO, 2001-present
- ◆ Senior Member of PA Consulting, Inc., Boulder, CO, 2001
- ◆ Vice President, Global Energy Business Sector, PHB Hagler Bailly, Inc., Boulder, CO, 2000
- ◆ From Senior Associate to Principal, Utility Services Group, Hagler Bailly Consulting, Inc., Boulder, CO, 1991-1999
- ◆ Senior Consultant, Energy Management Associates, Atlanta, GA, 1983-1988
- ◆ Internships at: Pacific Gas & Electric Company, San Francisco, CA (1990)
Lawrence Berkeley Laboratory, Berkeley, CA (1989-1991)
MIT Resource Extraction Laboratory, Cambridge, MA (1982)
Baltimore Gas and Electric Company, Baltimore, MD (1980)

EDUCATION

- ◆ Walter A. Haas School of Business, University of California at Berkeley, MBA, Valedictorian, Corporate Finance, 1991
- ◆ Massachusetts Institute of Technology, BS, Energy Engineering, 1983

PROFESSIONAL EXPERIENCE

- ◆ Developed and/or reviewed dozens of requests for proposals for utility resource solicitations.
- ◆ Conducted numerous competitive bidding and independent evaluations for conventional generating resources, renewable facilities, and off-system power purchases.
- ◆ Assisted in contract negotiations with shortlisted bidders in utility resource solicitations.
- ◆ Testified on utility competitive bidding solicitation results, affiliate transactions, cost recovery procedures, rate case calculations, and incentive ratemaking proposals.
- ◆ Managed the development of market price forecasts of North American and European electricity markets under deregulation.
- ◆ Performed financial modeling of electric utility bankruptcy workout plans.
- ◆ Managed the technical and economic appraisal of cogeneration facilities and brownfield generation sites.

- ◆ Trained and assisted many of the nation's largest electric and gas utilities in their use of operational and strategic planning computer models.

SELECTED PROJECTS

2006- **Southern California Solicitations for Conventional and Renewable Resources**
2007 Client: Southern California Edison

Serving as the Independent Evaluator in two main solicitations for new power supplies in Southern California – one for 1,500-2,000 MW of conventional dispatchable resources and a second for renewable energy purchases to help Southern California Edison meet its California Renewable Portfolio Standard (RPS) targets. Mr. Taylor is managing a Sedway Consulting team that is performing a parallel evaluation of all proposals, monitoring communications with power suppliers, and supporting the review of the final selected proposals by the Procurement Review Group – a collection of non-market-participant stakeholders and regulators who have been provided confidential access to the evaluation results at intermediate stages.

2005- **Northern California Solicitations for Conventional and Renewable Resources**
2007 Client: Pacific Gas & Electric

Performed as the Independent Evaluator in three solicitations for new power supplies in Northern California – one for 2,200 MW of conventional resources and two others for between 700 and 1,400 GWh/year (each) of renewable energy purchases for RPS purposes. Virtually identical to the activities described above for the Southern California solicitations, Mr. Taylor and his Sedway Consulting team performed a parallel evaluation of all proposals, monitored communications with power suppliers, and assisted the PRG with its review of the final selected proposals.

2005- **Florida Solicitation for New Resources**
2006 Client: Florida Power & Light

Served as the Independent Evaluator in Florida Power & Light's solicitation for 2,400 MW of new power supplies for 2009-2011. Mr. Taylor performed a parallel economic evaluation to that which was undertaken by the utility, reviewing detailed cost and revenue requirement calculations associated with power purchase agreement, facility sale, and utility self-build proposals. His work efforts allowed all proposal parameters to be cross-checked and corrected where necessary. He sponsored testimony before the Florida Public Service Commission concerning the results of the solicitation evaluation.

2005 Colorado Solicitation for New Resources

Client: Xcel Energy

Provided evaluation services for Xcel Energy's solicitation for 2,500 MW of new power supplies in Colorado for 2007-2013. Mr. Taylor performed a parallel evaluation of dozens of proposals for new resources, contract extensions, and complicated contract restructurings. He assisted with proposal interpretation and clarification and an independent review of the economic considerations of proposal selection.

2004- Regulatory Support of Commission Staff

2005 Client: Utah Division of Public Utilities

Assisted staff for the Utah Division of Public Utilities in the division's efforts to analyze PacifiCorp's 2005 rate case. Mr. Taylor reviewed production cost modeling results and forecasts of system-wide fuel and purchase power costs.

2004- Minnesota Solicitation for New Resources

2005 Client: Minnesota Power

Provided independent evaluation services in a solicitation for 200 MW of firm power supplies. Mr. Taylor reviewed all proposals and performed a parallel economic evaluation among proposed turnkey facilities and power purchases.

2004 Canadian Solicitations for Conventional and Renewable Resources

Client: Ontario Energy Ministry

Participated in a broader consulting team and provided assistance in the development of RFPs for 2,500 MW of conventional resources and 300 MW of renewable resources. New long-term sources of power were sought to replace regional coal-fired generation.

2003- Florida Solicitation for New Resources

2004 Client: Florida Power & Light

Provided independent evaluation services in Florida Power & Light's solicitation for 1,100 MW of new power supplies for 2007. Mr. Taylor performed a parallel economic evaluation to that which was undertaken by the utility. His work efforts allowed all proposal parameters to be cross-checked and corrected where necessary. He sponsored testimony before the Florida Public Service Commission concerning the results of the solicitation evaluation.

2002- **Minnesota Solicitation for New Resources**

2003 Client: Northern States Power

Assisted in the evaluation of a large number of multi-option proposals for new power supplies in the 2005-2009 time frame. Mr. Taylor was the independent evaluator in two separate solicitations. He managed a team of individuals in the evaluation of responses for both Requests for Proposals (RFPs). In the first solicitation, contingent proposals were received that could serve as replacement contracts for 1,100 MW of nuclear capacity if NSP were forced to decommission its Prairie Island power plant in 2007. In the second solicitation, NSP sought approximately 1,000 MW of new supplies to supplement its existing supply portfolio. The evaluation included the review of over a dozen proposed wind projects.

2002 **Florida Revisions to Bidding Rule**

Client: Consortium of utilities

Provided the Florida Public Service Commission with recommendations concerning appropriate revisions to the state's bidding rule. Mr. Taylor participated in public workshops to provide the benefits of his extensive experience in performing competitive bidding solicitations and to convey what changes should or should not be made to Florida's existing bid rule to ensure the selection of the best resources for the state's electricity customers.

2002 **Arizona Testimony Concerning Competitive Bidding Solicitations**

Client: Harquahala Generating Company, LLC

Filed testimony before the Arizona Corporation Commission in the Generic Proceedings Concerning Electric Restructuring Issues and Associated Proceedings. Mr. Taylor's testimony provided the Commission with information about competitive bidding processes that he had seen work in other states. Also, his testimony addressed various concerns that were raised by Arizona Public Service as to the feasibility of implementing competitive bidding in Arizona.

2002 **Florida Solicitation for New Resources**

Client: Florida Power & Light

Provided independent evaluation services in Florida Power & Light's solicitation for 1,750 MW of new power supplies in the 2005-2006 time frame. Mr. Taylor performed a parallel economic evaluation to that which was undertaken by the utility. His work efforts allowed all proposal parameters to be cross-checked and corrected where necessary. Also, he provided suggestions on resource optimization modeling approaches that ensured the most comprehensive examination of thousands of potential combinations of proposals.

2001 Wisconsin Testimony Concerning Competitive Bidding Solicitations

Client: MidWest Independent Power Suppliers

Provided testimony in a proceeding before the Wisconsin Public Service Commission on behalf of a consortium of independent power producers. Mr. Taylor testified on the benefits and timing of a competitive bidding solicitation that Wisconsin Electric Power Company (WEPCO) should be ordered to conduct prior to the utility's development of \$2.8 billion in self-build generation facilities (embodied in a WEPCO proposal called Power the Future – 2). Without the benefits of a competitive solicitation, there would be no defensible means of ensuring that the utility's customers were being offered the best, most cost-effective resources.

2001 Negotiation of Full-Requirements Purchase Contract

Client: Georgia cooperative utility

Assisted in negotiation of a \$2 billion power purchase contract. Mr. Taylor worked with a team of legal experts and other consultants to assist the client in negotiating a 15-year full-requirements contract with a large, national power supplier. Detailed modeling simulations were performed to compare the complex transaction to the utility's own self-build alternatives. Mr. Taylor helped investigate and negotiate detailed provisions in the power supply contract concerning ancillary services and other operational parameters.

2001 Evaluation of Resource Proposals

Client: North Carolina municipal utility

Reviewed responses to a utility resource solicitation and assisted the client in developing a short list of the best bidders. Mr. Taylor reviewed the results of the client's economic analysis of the proposals and provided insights on various nonprice factors related to each of the top-ranked proposals. Mr. Taylor helped the client in structuring and strategizing for the negotiation process.

2000- Solicitation for New Resources

2001 Client: Public Service of Colorado

Assisted in the evaluation of a large number of multi-option proposals for new power supplies in the 2002-2005 time frame. Mr. Taylor managed a team of a dozen individuals who performed economic and nonprice evaluations of conventional and renewable proposals. Mr. Taylor developed recommendations for a short list of the best resources and managed a supplemental evaluation of second-tier bidders when the client's capacity needs subsequently increased. Ultimately, over \$2 billion of contracts were negotiated for over 1,700 MW of new power supplies under terms of up to 10 years. Mr. Taylor testified before the Colorado Public Utilities Commission on the processes and results of both the primary and supplemental evaluations.

1999- **Solicitation for New Resources**
2000 Client: MidAmerican Energy

Reviewed MidAmerican's solicitation for new power supplies for the 2000-2005 resource planning period. Mr. Taylor managed a team of individuals who performed an independent parallel evaluation of MidAmerican's analysis of responses to the utility's request for proposals (RFP). Mr. Taylor reviewed MidAmerican's evaluation and negotiation process and testified to the fairness and appropriateness of MidAmerican's actions. He filed testimony before the utility regulatory commissions in Iowa, Illinois, and South Dakota.

2000 **Electricity Market Assessments**
Client: various American and European clients

Helped develop electricity market prices for regional electricity markets in North America (California, New England, Arizona/New Mexico, Louisiana) and Europe (Austria, Belgium, France, Germany, and the Netherlands). Mr. Taylor worked with project teams in the U.S. and Europe to develop simulation models and databases to forecast energy and capacity prices in the deregulating power markets.

1999 **Evaluation of New Resources**
Client: Florida Power Corporation

Helped prepare FPC's RFP for long-term supply-side resources and assisted in the independent evaluation of responses. Mr. Taylor oversaw the review of FPC's computer simulations (in PROVIEW and PROSYM) of the proposals that were received. The project team also evaluated the proposals by using a response surface model to approximate the results that might be produced in the more detailed simulations. Mr. Taylor testified before the Florida Public Service Commission concerning his assessment of FPC's solicitation and the results of the analysis.

1998 **Evaluation of New Resources**
Client: Public Service of Colorado

Assisted the evaluation of proposals for PSCo's near-term 1999 resource additions and managed the complete third party evaluation of proposals for resources in the 2000-2007 time frame. Such resources included third-party facilities and power purchases, as well as company-sponsored interruptible tariffs. Mr. Taylor assisted with the development of the request for proposals and oversaw the evaluation of all responses. He and his team monitored subsequent negotiations with shortlisted bidders. Mr. Taylor testified before the Colorado Public Utilities Commission on the fairness of the solicitation and the results of the evaluation.

1997- Evaluation/Negotiation of Transmission Interconnection Solicitation

1999 Client: New Century Energies

Managed a solicitation for participation in a major transmission project interconnecting Southwestern Public Service (a Texas member of the Southwest Power Pool) and Public Service of Colorado (a member of the Western Systems Coordinating Council). As the first major inter-reliability-council transmission project in the era of open access, FERC required that SPS and PSCo solicit third-party interest in participation. This project required the development of an RFP and evaluation of responses for both equity participation and long-term transmission service for over 21 alternative high-voltage AC/DC/AC transmission projects. The evaluation focused on the costs and intangible risks of different transmission alternatives relative to the benefits and savings associated with increased economy interchange, avoided future generating capacity, and reductions in single-system spinning reserve and reliability requirements.

1996- Evaluation/Negotiation of All-Source Solicitation

1997 Client: Southwestern Public Service

Managed the evaluation of a broad array of responses to an all-source solicitation that was issued by Southwestern Public Service (SPS) in Texas. Resources in the areas of conventional supply-side generation, renewable resources, off-system transactions, DSM, and interruptible loads were proposed. The evaluation entailed scoring the proposals for a variety of price and nonprice attributes. Mr. Taylor assisted Southwestern in its negotiations with the bidders and performed the detailed evaluation of the best and final offers.

1996- Risk Assessment for 1,000-MW Solicitation

1997 Client: Seminole Electric Cooperative

Managed the review and assessment of risks associated with responses to a 1,000-MW solicitation that was issued by Seminole Electric Cooperative. The evaluation entailed reviewing selected proposals' financial feasibility, performance guarantees, fuel supply plans, O&M plans, project siting, dispatching flexibility, and bidder qualifications.

1997 Analysis/Testimony Concerning Louisville Gas & Electric's Fuel Adjustment Clause

Client: Kentucky Industrial Utility Customers

Performed a detailed examination of Louisville Gas & Electric's (LG&E) fuel adjustment clause and identified misallocated costs in the areas of transmission line losses and purchased power fuel costs. Mr. Taylor also critiqued LG&E's rate adjustment methodology and recommended closer scrutiny of costs associated with jurisdictional and non-jurisdictional sales. Mr. Taylor testified before the Kentucky Public Service Commission and presented the findings of his analysis.

1995 Development of All-Source Solicitation RFPs

Client: Southwestern Public Service

Managed the development of five RFPs that solicited resources in the areas of conventional supply-side generation, renewable resources, off-system transactions, DSM, and interruptible loads. The RFPs were issued by SPS as part of an all-source solicitation to identify resources that may be competitive with two generation facilities that SPS intended to develop.

1994 Development of Competitive Bidding RFP

Client: Empire District Electric Company

Based on knowledge gained from the review of dozens of other utility RFPs, developed a combined-cycle resource RFP for Empire District Electric Company. The project team was responsible for the RFP's entire development, including the development of scoring provisions for price and nonprice project attributes.

1993 Selection of Developer for 25 MW Wind Facility

Client: Northern States Power

Evaluated ten bids that were received by NSP in a solicitation for the development of a 25 MW wind facility in Minnesota. The proposals were scored and ranked through a point-based evaluation system that was developed prior to the solicitation. The scoring involved an assessment of operational and financial feasibility, power purchase pricing terms, construction schedules, and community acceptance issues.

1993 Competitive Bidding Design

Client: Northern States Power

Assisted NSP in the utility's effort to design a generic competitive bidding RFP that could be issued for a variety of generation resources. Two dozen RFPs from other utilities were reviewed to determine the appropriate weights and mechanisms that should be used to score various project attributes.

1993 Evaluation of 500 MW Supply-Side Solicitation

Client: San Diego Gas & Electric

Assisted in the evaluation of 15 bids that were received from a 500 MW solicitation for power by SDG&E. The utility wanted to determine whether or not there were less expensive alternatives to the implementation of its plan to repower one of its own units. The 15 projects represented over 4,000 MW. The bids were evaluated using extensive production costing modeling, in which over 1,000 model runs were performed to evaluate each bid under a variety of scenarios