UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

California Independent System Operator Corporation	Docket No. ER12-897-000

AFFIDAVIT OF ROBERT B. STODDARD
ON BEHALF OF THE NRG COMPANIES AND THE DYNEGY COMPANIES

I, Robert B. Stoddard, being duly sworn, depose and say:

I. QUALIFICATIONS

1. My name is Robert B. Stoddard. I am a Vice President and the leader of the Energy & Environment Practice of CRA International ("CRA") in its offices at 200 Clarendon Street, T-33, Boston, Massachusetts 02116. My work as an economist over the past decade has focused on electricity industry restructuring and on providing strategic analyses and testimony for utilities, generation owners, and governments regarding the financial implications of market design and structure, particularly regarding Regional Transmission Organizations ("RTOs") in New England, New York, the Mid-Atlantic, and Midwest. As shown in the attached Exhibit RBS-1, I have testified frequently before the Federal Energy Regulatory Commission ("Commission") and various states' legislatures and utility commissions on competitive market design and market power issues. I hold degrees in economics from Amherst College and Yale University.

2. Professionally, I am best known to the Commission and to California stakeholders for my extensive involvement in market designs intended to attract and retain sufficient

capacity resources. In California, I had a significant role in developing the California Forward Capacity Market ("CFCM") design in California Public Utilities Commission proceedings, where I represented a coalition of utilities and generators (Southern California Edison and San Diego Gas & Electric; NRG Energy, Inc. ("NRG"), RRI Energy (now merged into GenOn Energy), and NextEra Energy Resource). The CFCM approach received broad-based support, including that of the California Independent System Operator ("CAISO"), energy retailers, and end-use customers.

3. I have testified about capacity market issues in every Commission-jurisdictional organized market. In addition to the work described above in California:

- In New England my work in capacity markets began with affidavit support for FPL Energy (now known as NextEra Energy Resources) on issues of locational capacity requirements in the *Devon Power* proceeding.[1] When the Commission set the matter for hearing, I was engaged by four of the largest generation owners in New England to testify in the *Devon Power* hearings regarding the development of a Locational Installed Capacity ("LICAP") market. In the ensuing settlement process, I continued to represent generation owners throughout the negotiations to develop Forward Capacity Market ("FCM") settlement agreement. In support of the settlement agreement, ISO New England ("ISO-NE") filed my affidavit, along with affidavits of the other two lead economists in the settlement. Since the adoption of the FCM, I have continued as an active participant in FCM rules development and on-going review of the market effectiveness, including participation in the FCM working Group through much of

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[1] *Devon Power LLC*, Docket No. ER03-563-030, Protest of FPL Energy, LLC, Affidavit of Robert B. Stoddard (Mar. 22, 2004).

2009 on behalf of the New England Power Generators Association ("NEPGA").

- In New York, I testified on behalf of Consolidated Edison Company of New York ("Con Ed") and other load interests. Prior to the start of the market in 1999, I worked with my colleague Dr. William Hieronymus to develop market power mitigation measures for New York City generation being divested by Consolidated Edison ("Con Ed"). Later, I testified for Con Ed and others regarding the transition of NYISO markets from an installed to an unforced metric. I have continued to monitor the New York markets closely on behalf of my commercial clients, including the City of New York.

- In PJM, I represented Mirant and other generators throughout the settlement discussions that led to the development of the Reliability Pricing Model ("RPM") and have since testified frequently on needed reforms to that market design.

- In the Midwest ISO, I have testified on behalf of Duke Energy and FirstEnergy on deficiencies in the Midwest ISO's "Module E" resource adequacy approaches and advocated a prompt transition from the monthly deficiency auctions to a more robust design.

4. Overseas, my team and I have worked on resource adequacy issues for the market operators of the Russian Federation, Portugal, and the Republic of Ireland.

II. OVERVIEW AND SUMMARY

5. I have been asked by counsel for the NRG Companies and the Dynegy Companies to review the CAISO's Petition for Waiver of Tariff Revisions ("Petition") to assess the broader implications of this Petition for the efficient and equitable operation of the CAISO markets.

6. In its Petition the CAISO brushes aside concerns that this waiver has any broader implications: "Granting this waiver request will not establish a general model for procuring capacity from resources to address long-term system needs in California."[2] I disagree. The need for this waiver is the proverbial canary in the coal mine; the short-term expedient of a CPM contract may keep Sutter alive, but it fails to address meaningfully the underlying poisonous atmosphere that is the economic climate in the CAISO markets today. As the Commission determined a decade ago in *Devon Power* in New England, the need for *ad hoc* contracting with resources for reliability is a clear sign of structural flaws in the market design.[3]

7. I have no position regarding the direct merits of the waiver request. As a general matter, *ad hoc* contracting for resources by an RTO outside of a market-based mechanism weakens the robustness of the regional energy and capacity markets. Thus, from first principles, this waiver would result in an adverse market impact by failing to provide for a market-based method for securing capacity to provide for a *potential* capacity shortfall—and a shortfall *not* anticipated by the state regulator with primary responsibility for resource adequacy. Weighing against this general point, however, is a rational concern about the potential retirement of a major capital asset such as the Sutter Energy Center ("Sutter"). Assuming that Calpine is a rational economic actor (which I believe it is), its request to retire Sutter has little to do with that plant's earnings in 2012. It reveals far more about Calpine's pessimistic view about the long-run economic conditions for California generators. The CAISO's own studies support this pessimistic view, pointing to sharply reduced revenues and higher

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2 Petition at 17.

3 *See Devon Power LLC, et al.*, 103 FERC ¶ 61,082 (2003) ("*Devon Power*").

operating costs going forward, as the amount of renewable energy on the CAISO system increases.

8. In my opinion, therefore, the Commission should only grant this Petition *if* it also requires a meaningful commitment from the CAISO to address these deeper, long-term market design issues similar to what the Commission required in *Devon Power*. Otherwise, this Petition will be the first of a long line of resources that are too essential to reliability, both now and in the future, to let go, but whose owners simply do not expect to earn enough money to justify their continued operation.[4]

9. The CAISO has not made sufficient commitments to address these problems. The CAISO mentions that it has begun a stakeholder process for Flexible Capacity Procurement, beginning with an Issue Paper dated January 27, 2012, ("Issue Paper") and intended to result in filings this summer and next with the Commission. The scope of this stakeholder process is too narrow, however, to address fully the deep structural flaws revealed by the Petition. CAISO has identified a clear gap in the resource adequacy program: namely, that the state's utilities' Long Term Procurement Plans ("LTPPs") look only to new construction, and assume no retirements; while utility contracting to meet load requirements is not required, in full, until just prior to the start of each month. Moreover, through the implementation of CPM and by filing the instant waiver request, CAISO has recognized that its day-ahead and real-time markets do not provide meaningful price signals that reward flexible generation.[5]

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[4] *See Devon Power* at 2-3 (finding that the "proliferation of [RMR] agreements is not in the best interest of the competitive market as they affect other suppliers participating in this market, especially those suppliers operating within the same DCA").

[5] *See Cal. Indep. System Operator Corp.*, Docket No. ER11-2256-0000 at p. 31 (filed Dec. 1, 2010) (noting that "[a] key objective of the CPM is to obtain needed backstop capacity that is

10. What CAISO should be designing and implementing are robust market mechanism that provides appropriate compensation for the provision and operation of flexible supply resources. Lacking such mechanisms, Sutter will be the first in a long line of resources that, like *Devon Power*, need a special deal. As in *Devon Power*, the Commission should forestall further waiver requests by requiring robust and timely compliance filings that implement such market mechanisms for flexible resources.

III. DEVON POWER, REVISITED

11. Reading the Petition and reviewing the underlying materials, I could not escape the feeling that I had seen this movie before, or perhaps its prequel. The fact pattern and general circumstances are, to my eye, remarkably similar to the market design issues in New England litigated nine years ago.

12. On February 26, 2003, Devon Power LLC et al., subsidiaries of NRG, filed four cost-of-service agreements with the Commission. NRG had negotiated these agreements with ISO New England, Inc. ("ISO-NE"), in accordance with market rules, for 1,728 MW of capacity in the deliverability-constrained areas ("DCAs") of Connecticut and Southwest Connecticut. These units were not exceptional, except for their location in a DCA. ISO-NE was "concerned that, under its current market rules and mitigation policies, some generators needed for reliability in load pockets – i.e., in DCAs – may be unable to recover their full fixed and variable costs and not be available for reliability."[6] Specifically, market power mitigation rules frequently capped bids in

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comparable to RA capacity and that will be available to the ISO in the day-ahead and real-time markets throughout the procurement period."); *see also* Petition at 32-34 (accepting Calpine's assertions that without a RA contract or other type of annual CPM contract, Sutter would not receive sufficient revenue to remain in operation in 2012 (Attachment A – p. 3)).

6 *Devon Power LLC et al.*, Order Accepting, in Part, Requests for Reliability Must-Run Contracts and Directing Temporary Bidding Rules, 103 FERC ¶ 61,082 (2003) ("April 25 Order") at 28.

DCAs, reducing energy earnings to units in those areas. Although ISO-NE had implemented *ad hoc* rules called the CT Proxy bids that were intended to provide for fixed cost recovery in DCAs, NRG demonstrated that its units could not recover their costs under this CT Proxy rule. Consequently, NRG sought, and ISO-NE agreed to, "temporary RMR contracts for its units that would pay them their full cost-of-service until ISO-NE is able to implement locational ICAP or some other form of locational capacity requirement."[7]

13. NRG's filing was vigorously opposed by parties from every sector. The Commission concurred generally, stating:

> RMR contracts suppress market-clearing prices, increase uplift payments, and make it difficult for new generators to profitably enter the market. … As a result, expensive generators under RMR contracts receive greater revenues than new entrants, who would receive lower revenues from the suppressed spot market price. In short, extensive use of RMR contracts undermines effective market performance. In addition, suppressed market clearing prices further erode the ability of other generators to earn competitive revenues in the market and increase the likelihood that additional units will also require RMR agreements to remain profitable. Therefore, we believe that ISO-NE, rather than focusing on and using stand-alone RMR agreements, should incorporate the effect of those agreements into a market-type mechanism.[8]

14. Rather than rubber-stamp the RMR contracts, the Commission took four actions that collectively changed the evolution of the ISO-NE markets away from one-off contracting and towards greater reliance on market mechanisms to assure reliability:

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7 Ibid.

8 Id. at 29.

a. First, it temporarily changed energy market rules to allow a greater markup over cost, "to provide a market mechanism for high cost, seldom run units to recover their fixed costs";[9]

b. Second, it required that energy from peaking units be allowed to set the market clearing price so that "all sellers will be able to receive a high market price and recover fixed costs."[10]

c. Third, it eliminated the CT Proxy price rule, now mooted by the previous two actions; and

d. Fourth, it directed ISO-NE to make a filing within approximately ten months for implementation no later than three months following the filing date of "a mechanism that implements location or deliverability requirements in the ICAP or resource adequacy market."[11]

Additionally, rather than affirming the full cost-of-service contracts with NRG, the Commission required that the RMR contract provide for "recovery of only forward maintenance costs."[12]

15. What followed has not been an easy process, involving extensive stakeholder discussions, a full hearing, a settlement process, and subsequent trips to the DC Circuit Court and the Supreme Court. While there are still important improvements that can and should be made in the ISO-NE markets, the net result of the *Devon Power* order has been a sufficiency of supply, generally and locationally, and robust

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9 Id. at 34.

10 Id. at 35.

11 Id. at 37.

12 Id. at 32.

development of new resources, particularly demand-side resources. Further, the D.C. Court of Appeals established through this case that the Commission has the appropriate role and clear right to establish markets that set reliability standards and price capacity, and attributes of that capacity, such as location, without infringing on state's rights to regulate electrical generation facilities.[13]

IV. CAISO'S PRESENTATION OF FACT, IN SUMMARY

16. Sutter is an unexceptional unit. A natural gas-fired, combined-cycle unit, it entered in commercial operation in July 2001, the first new power plant built in California in a decade. The plant provided much needed energy during the 2001 power crisis. Located about 35 miles north of Sacramento and pseudo-tied to the CAISO control area, Sutter provides truly generic system energy and reserves.

17. The only distinguishing characteristic of Sutter, compared to tens of thousands of other MWs of capacity in the CAISO control area, it along with over 1,200 MW of other flexible resources, lack a Resource Adequacy ("RA") contract for 2012.[14] Calpine avows that, lacking such a contract, Sutter would need at least $17.4 million of additional revenues[15] to justify delaying a decision to retire to the end of this year, because revenues from the energy and reserves markets alone are not sufficient to cover its costs. I have not undertaken any study to determine whether this $17.4

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13 *Connecticut Department of Public Utility Control v FERC*, 569 F.3d 477. "[T]he Commission may directly establish prices for capacity—or much the same, prices for failing to acquire enough capacity—even for the express purpose of incentivizing construction of new generation facilities. That the Commission may do so directly would seem to include the power to do so indirectly by setting a target for capacity demand and using a market mechanism to locate the price appropriate to that quantity." (citing *Municipalities of Groton v. FERC*, 587 F.2d 1300–3).

14 Petition at pp. 44-45.

15 Petition at p.37.

million is a reasonable sum based on Calpine's demonstrated costs, nor do I have an opinion thereon. The RA rate implied by the proposed contract with Calpine is $5.52/kW-month, or $66.29/kW-year, well above the "soft cap" imposed by the CPUC on RA contract prices.[16] My general understanding from discussions with various generation owners is that RA contracts generally pay less than the soft cap. I conclude, therefore, that numerous other generators agreed to bilateral RA contracts at relatively low prices, rather than remain entirely uncontracted.

18. The CAISO, however, expresses concern that within the next six years it may face a substantial shortfall of capacity and, in particular, dispatchable or "flexible" capacity capable of providing the load-following services needed to balance load and to integrate the variable energy resources that will be needed to meet California's targeted 33-percent renewable energy portfolio standard. "[T]he ISO's analysis of future needs identified an estimated 3,570 MW capacity gap by the end of 2017. The removal of 525 MW of [Sutter's] capacity … would exacerbate reliability issues and operational issues on the ISO grid and would result in a further capacity need…."[17] Further, the CAISO raises concerns "whether sufficient flexible capability would exist to meet the simultaneous energy, operating reserve, regulation and load following requirements" without continued reliance on Sutter and securing additional dispatchable resources.[18] The Petition makes clear that Sutter is valued not only for its energy, with an expected capacity utilization of about 70 percent, but also for its

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16 $46.10/kW-year is calculated as $17.4 million divided by 525,000 kW for a six month period (Petition at pp. 37, 9, and 4, respectively).

17 Id. at p.17.

18 Id. at p.19.

ability to provide Spinning Reserve, Non-Spinning Reserve, Regulation, load following up, and load following down.[19]

19. The Petition highlights an interesting point of difference between the CAISO's perspective and those of some stakeholders, namely that, as the organization tasked by federal law with the reliable operation of the grid, CAISO uses an "operations planning scenario" that considers greater risks than other scenarios would. By contrast, the four scenarios prioritized by the CPUC paint a very different picture of the future: while the CAISO's operations planning scenario has a peak load of 50,672 MW in 2020, the CPUC's four priority scenarios use a peak load of approximately 45,000 in 2020, a number that anticipates aggressive energy-efficiency gains and the tripling of participation by demand-side programs.

20. The gap between the conservative CAISO perspective and the more bullish CPUC perspective raises important issues, because a capacity supplier will consider the likely economic returns over a large range of scenarios when assessing its economic prospects, while the CAISO uses for planning purposes a world with tighter margins (and, by implication, greater economic rewards for generators). Thus, the CAISO may see a need where an investor does not see a viable financial opportunity.

21. Calpine's announcement of its plan to permanently retire Sutter has provoked three responses. First, CAISO proposes in its Petition to contract with Calpine to provide this missing $17.4 million in 2012. Second, the CPUC is poised to require the state's three utilities to negotiate an RA contract with Sutter for 2013 and beyond;[20] this

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19 Id. at p.27.

20 In a memorandum to the CAISO Board of Directors dated February 9, 2012, CAISO Vice President Karen Edson states: "In a related activity, the Energy Division of the CPUC issued a draft resolution that would require the investor owned utilities to jointly negotiate a limited-term

alone will have an adverse effect on the market, as the mandated RA contract with Sutter will displace contracted volumes with other capacity suppliers and drive down the market price for system RA. Third, CAISO has initiated a stakeholder process to address Flexible Capacity Procurement, though this stakeholder process only contemplates modifying the current risk of retirement provisions in Phase 1 and defers any other considerations to a yet-defined Phase 2.

V. THE FACTS INDICATE SYSTEMATIC MARKET FAILURES

22. As was the case with *Devon Power*, an apparently innocuous request for a short-term contract actually masks a series of systematic market failures. And, as was the case with ISO-NE, the CAISO has not proposed systematic reforms that could plausibly result in economically efficient and equitable outcomes. The market failures exist at every timeframe of the California energy market: long-term resource adequacy, long-term operational adequacy, and short-term energy and reserves markets. The fixes proposed for Sutter, namely a short-term contract through the CAISO and CPUC-mandated RA contracts, only address a small portion of the problem that the CAISO clearly identifies in the Petition.

23. How can I be so confident of this diagnosis? Because the action Calpine proposes is so drastic. The replacement cost of Sutter is somewhere north of $500 million, and it

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contract with Calpine for the Sutter plant. The draft resolution orders Calpine to not retire the facility during the negotiations. This resolution is expected to be considered for adoption by the full Commission during their meeting on February 16. Some parties have suggested the ISO petition and the CPUC draft resolution are in conflict. However, the proposed CPUC resolution and the ISO request for tariff waiver both share the same goal—to keep the Sutter plant available for 2012. These complementary efforts will run in parallel over the next few months. The ISO tariff provisions provide that, if the Sutter plant is procured, the ISO will either not provide the capacity procurement mechanism designation or will stop the ISO capacity payment to avoid making duplicate payments. Either approach will result in an agreement with Calpine and avoid the retirement of this flexible resource during 2012." http://www.caiso.com/Documents/Status-State_FederalLegislativeMattersFeb2012.pdf

is only in its tenth year of operation. Further, Calpine has argued (credibly, in my view) that once it shuts down for over five years, compliance with environmental regulations would make reactivation unlikely. I do note that for a shorter period of time – two years for example – a unit could likely be mothballed and brought back into operation. In my experience, Calpine is prudently and thoughtfully managed; it would not discard an asset without a thorough assessment of the likely future net revenues. Nor is Calpine naïve in the ways of the California market; their West Coast team includes both commercial and regulatory staff whose judgments I can personally vouch for.

24. The fact, therefore, that Calpine sees so little prospect for earning a reasonable return over the future, long life of Sutter is an indictment of the California markets (or lack thereof). Commercial entities like Calpine understand full well that business is cyclical. A major capital investment like Sutter provides its owner an option to participate in the market going forward. The option is expensive, and it may not pay off in every period (as Calpine attests Sutter is not paying off now). While discarding the option by retiring the asset staunches the near-term bleeding, it also forecloses the ability to earn profits in the future. Therefore, Calpine's retirement decision tells us more about its expectations of *future* period profits than about current market conditions, and its verdict is harsh.[21]

25. Calpine has good reason for pessimism. Sound market design should provide valuable, economic resources like Sutter with a reasonable expectation of earning a

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[21] Calpine's analysis of the economic conditions for Sutter clearly are forward looking; the Affidavit of Alexandre B. Makler In Support of Calpine Corporation's Request for CPM Designation of the Sutter Energy Center under CAISO Tariff Section 43.2.6 states that "[t]he analyses that Calpine conducted indicate an unacceptable level of risk that Sutter would not recover its going forward costs or meet its cash and investment requirements in 2012 *an subsequent years.*" (P 4, emphasis added).

fair return on and of investment. In all the other jurisdictional RTO markets, these earnings come through a combination of the energy, ancillary services, and capacity markets.[22] In California, the CPUC has rejected the development of an organized capacity market, the CAISO's energy and ancillary service markets provide little in the way of fixed cost recovery and the CAISO has been slow to develop robust markets for the full suite of reserve products that it will need to integrate large quantities of new variable energy resources. Consequently, there are gaping holes in the market mechanisms by which Sutter or other similarly situated generators could be compensated.

A. DIFFERENCE BETWEEN OPERATIONAL PLANNING SCENARIOS AND FINANCIAL PLANNING SCENARIOS

26. Throughout the Petition, the CAISO refers to the value of Sutter's flexible operating characteristics. Whatever the *operational* value of this flexibility, it is apparently not reflected in the *market* value of units capable of providing this flexibility: no utility chose to contract with Sutter, and Calpine sees insufficient future revenues from reserves and energy to justify continued operation of Sutter, despite the CAISO's prediction of absolute shortages of reserve-capable capacity.

27. The market of first resort for compensating suppliers of reserves should be the day-ahead and real-time energy markets that CAISO operates. These markets, however, are volatile and highly dependent on the degree of supply scarcity; unlike energy, there are no forward contracts for reserves that can hedge this risk, nor do energy contracts typically require certain levels of associated reserve products.

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[22] The Southwest Power Pool is an exception, as it is early in its development of a full suite of markets.

28. Based on its operational planning scenarios discussed in the Petition, the CAISO sees a sufficiently high likelihood of capacity shortfalls, particularly of flexible generation, to merit action. Calpine and other generation owners, however, must consider profitability under a full range of future market outcomes. This difference in perspective can easily create a gap between what resources the grid operator views as essential, and what resources their owners consider economically viable.

29. Thus, there is a gap between the projected operational requirements of the CAISO and the financial incentives of capacity suppliers. In RTOs with capacity markets, this gap—often called the "missing money"—is closed with capacity payments. In California, however, life is more complicated.

B. CALIFORNIA'S RA PROGRAM FAILS TO CLOSE THE GAP

30. The RA program in California has a long and tortured history, which I will not recount in full. Throughout 2007 and 2008, the CPUC conducted extensive rounds of comments and workshops to study alternatives to its complex RA construct. During this proceeding, a strong consensus developed supporting a centralized capacity market, administered by the CAISO, that would secure binding commitments from all required capacity four years ahead of the delivery year. The "Centralized Forward Capacity Market" framework was supported by the CAISO, two of the three investor-owned utilities, much of the generation community and retailers. Ultimately, however, the CPUC decided to continue with its existing program, which has as its two primary elements the utilities' Long-Term Procurement Plans ("LTPP") and near-term showings of sufficient RA contracts to meet load. Other Local Regulatory Authorities ("LRAs") have full autonomy over their forward planning and required reserve margins but, under recent changes to the CAISO tariff, must meet those

reserve margins in a way that is comparable to CPUC-jurisdictional Load-Serving Entities ("LSEs").[23]

31. The CAISO has identified several important gaps in this RA construct:

    a. The LTPP provides a blueprint for building new resources, but not for securing overall system reliability. "While the CPUC looks out to a 10-year horizon in LTPP (with a particular focus on new capacity builds) and a single year ahead in RA, neither of these programs currently completely addresses the capacity needed in years two through nine. For example, while LTPP looks out ten years, with the exception of some anticipated generation retirements, it assumes that the existing generation fleet remains intact. The LTPP does not consider the economic decisions of owners of generation without RA contracts. If a generator's power purchase agreement or RA contract expires in the middle of the LTPP outlook, there is no consideration in the LTPP that retirement might be the best economic option for the generator owner."[24]

    b. The LTPP does not reflect the operational reliability needs of the CAISO. "[T]he CPUC last issued a LTPP final decision of need in 2007 (to meet 2014 demand). … [T]he 2007 CPUC LTPP decision did not fully consider the ISO's need for integrating large numbers of renewable resources …."[25]

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23 With the Commission's recent approval of the addition of a Nevada utility into the CAISO, the CAISO will soon become a multi-state RTO and, presumably, the Nevada utility will act as its own LRA and set its own reserve margins.

24 Issue Paper at p.7.

25 Ibid.

c. The LTPP does not encompass the entire CAISO load. "[W]hile approximately 90 percent of the ISO load is CPUC jurisdictional and subject to the CPUC's RA requirements, there is still approximately 10 percent that is not. Ensuring the ISO has sufficient access to flexible resources requires a larger effort that includes not just the CPUC, but also non-CPUC jurisdictional entities with the ISO footprint."[26]

32. In operation, the LTPP and RA contracting approach results in discriminatory payments to new and existing resources. New resources, secured through the LTPP, are either included in utility rate base or have a long-term power purchase agreement. Existing resources, however, must enter into negotiations on a case-by-case basis; considering that there are only three buyers, and each has a local monopoly, the economic balance between buyer and seller generally favors the buyer who can engage in price discrimination among suppliers. Moreover, as there is no requirement to enter into an RA contract with existing units until shortly before the beginning of each delivery year—and even then, only to 90 percent of the full RA requirement (which includes the projected peak demand plus a 15 percent planning reserve margin), with the balance proved up month-to-month—the market structure is heavily skewed to drive prices downward. We have observed how this market dynamic played out in the capacity markets of PJM, New York, and New England before their capacity markets included forward procurement, demand curves, or both: short-term RA contracting with no demand curve results in near-zero RA prices almost always, thus providing no market signal to support development of new capacity, investment in existing resources, or retirement. The facts presented in this case clearly make this point: absent any market signal that Sutter (or similar capacity) will be needed in the

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[26] Ibid.

future, Calpine has no economic incentive to continue to lose money by continuing operations there.

C. THE CAISO FLEXIBLE CAPACITY PROCUREMENT PLAN IS FUNDAMENTALLY INSUFFICIENT TO CLOSE THE GAP

33. Recognizing that these gaps in RA procurement, the CAISO has recently launched a stakeholder process to define a Flexible Capacity Procurement process. While this sounds promising, a careful examination of the Issue Paper reveals that it cannot result in sensible economic outcomes.

34. The CAISO contemplates two roles for itself:

    a. Actively participating in the CPUC's RA and LTPP proceedings and [working] with other non-CPUC jurisdictional LRAs to establish requirements to ensure load-serving entities procure flexible capacity.

    b. Designing a backstop mechanism, using up to a five-year forward assessment, by which flexible capacity at risk of retirement can be secured to prevent retirements that could exacerbate the challenges of reliably operating the grid. Additionally, this backstop authority would allow the ISO to backstop any deficiencies in the load-serving entity's procurement of flexible capacity resources under CPUC's or other LRA's respective RA programs.[27]

35. This limited program cannot result in just and reasonable prices. First, as proposed, it is the CPUC and other LRAs that will establish requirements, if any, to procure flexible capacity. If the CAISO disagrees with the requirements, it is unclear what recourse, if any, it has. In the present Petition, there is less than universal agreement about future needs; similar disagreements are likely to occur in the future. As the

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[27] Id at p.11.

reliability coordinator for the its footprint, however, it must in the end be the CAISO that has the authority to secure needed operational characteristics to fulfill its legal obligations. Presumably, this authority would be included in the five-year backstop procurement plan; however, because the CAISO only anticipates paying existing resources at risk for retirement, rather than attracting new resources (which the CAISO believes will take at least seven years to plan, permit and construct). Thus the CAISO could find itself without sufficient physical resources to meet its reliability requirements, even if it fully anticipates these requirements ten years in advance.

36. Second, the CAISO contemplates paying only those resources "at risk of retirement." This approach is fundamentally antithetical to the "Law of One Price" that has governed the Commission's approach to market design in California and elsewhere. Absent a true market-based mechanism to secure this forward reserve requirement, this Commission will be faced with a regular queue of cost-based contracts for approval, each awarding a different price for the same service through an RMR contract or an administratively set price through the CPM. Moreover, the CAISO will not have determined the least-cost solution to the problem, as it will fail to provide any market-based price to encourage investment in upgrades to resources to increase their flexibility, and so it may end up paying to hold retiring resources that are more costly than alternatives. For these reasons, it is my view that the waiver will result in adverse impacts to the California electricity and RA markets.

VI. CONCLUSION

37. As Gary Ackerman, executive director of the Western Power Trading Forum, aptly described once in the organization's newsletter, *The Burrito*, California is the land of haves and have-nots: those who have utility contracts and those who do not. Part of the "fix" contemplated by the CPUC for Sutter is to require its utilities to enter into a

long-term RA contract. While this will move Sutter into the land of the "haves", it does not address any of the fundamental flaws revealed by the need to file the Petition. Even if it can forestall Sutter's retirement, the CAISO still anticipates a capacity deficiency of 3,570 MW of generic system capacity, and an unspecified amount of capacity capable of providing flexible reserves. The CAISO has not, however, proposed or even contemplated a comprehensive market-based mechanism to secure this capacity, either from new resources, including demand response, or by forestalling retirements of plants facing once-through-cooling regulation; the Flexible Capacity Procurement process starts crippled and will at best produce patchwork results, rather than the just and reasonable prices required by the Federal Power Act.

38. The fact that Sutter would be granted a contract, initially from the CAISO and then from the CPUC-regulated utilities, without any competitive process, is troubling. Sutter is a generic system resource, and there are other resources in California without RA contracts; there are also resources that the CAISO assumes would retire because of once-through cooling issues that are potentially more cost-effective at addressing system needs. Lacking any process to award contracts for the need that the CAISO has identified in 2018, the Commission can have no assurance that customers are receiving clear value from this waiver, relative to potential alternatives. But the greatest concern raised by the Petition is its short-sighted view, putting a bandage on a broken market rather than implementing a comprehensive solution.

39. Regardless of what decision the Commission reaches with respect to Sutter, it should take the same bold action it did in *Devon Power* and address the underlying structural deficiencies in the CAISO markets that resulted in the Petition. As in *Devon Power*, these deficiencies exist in both the operational markets and in RA procurement:

a. The CAISO has begun, with its Flexible Ramping stakeholder process, to address the lack of proper compensation for resources that can provide ramping services; this process is a necessary, though probably not sufficient, improvement to the current ancillary services market design. More fundamentally, however, the CAISO must take up two further questions: how reserve scarcity conditions should be reflected in prices of ancillary services and energy; and how costs should be allocated to market participants to encourage firm import schedules, well-controlled loads, and dispatchable generation.

b. The Commission should require the CAISO to file a comprehensive forward market design to secure commitments from planned and existing resources to provide both energy *and* reserves sufficiently in advance of the delivery year to forestall premature retirements, and to allow investment in capital improvement in existing facilities to meet environmental requirements and/or to offer greater flexibility to the CAISO. This market would run after the CPUC's LTPP process and so would serve as a backstop to the primary RA jurisdiction of the CPUC and other LRAs. By securing commitments for the *entire* requirement through a market-based mechanism, the CAISO would provide non-discriminatory payments to all capacity supply resources, including those resources needed to meet locational and operational requirements—not just those who are poised on retirement. This mechanism, furthermore, would truly be a backstop to the CPUC process, inasmuch as all resources secured in the LTPP and proceeding through the development process would be included as available supply resources, possibly as price-takers to ensure that they clear. Thus the mechanism would support just and

reasonable pricing for reliability services without impinging on states' rights to regulate electrical generation facilities.

The Commission should cure the problem, not merely treat the symptom.

40. This concludes my affidavit.

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

California Independent System Operator Corporation	Docket No. ER12-897-000

AFFIDAVIT OF ROBERT B. STODDARD
ON BEHALF OF NRG ENERGY, INC.

I, Robert B. Stoddard, being duly sworn, depose and state that the contents of the foregoing Affidavit on behalf of NRG Energy, Inc. is true, correct, accurate and complete to the best of my knowledge, information, and belief:

Robert B. Stoddard

SUBSCRIBED AND SWORN to
before me this 16 day of February, 2012

Suzanne M. Walsh
Notary Public
My commission expires: 2/9/18



Robert B. Stoddard

Vice President and
Practice Leader, Energy & Environment

MA and MPhil Economics
Yale University

BA Economics and Music
summa cum laude
Amherst College

Vice President Robert Stoddard heads CRA's Energy & Environment Practice. He has over twenty years of experience assisting clients in defining, analyzing, and interpreting the economic issues involved with competition and product valuation in energy and other markets. His recent work has focused on electricity industry restructuring and on providing both strategic analyses and testimony for utilities, generation owners, and governments regarding the practical implications of market design and structure, particularly in New York, New England, and PJM. He has submitted testimony to the Federal Energy Regulatory Commission as well as to the utility commissions and legislatures of several states on competitive market design and market power issues, and he as testified in civil litigation and arbitration on the interpretation of, and damages relating to, energy contracts. He recently was the lead economist for capacity suppliers in developing the New England capacity market, played a central role in negotiating the settlement of the PJM Reliability Pricing Model, and developed the leading proposal for the design of a capacity market for California. In related areas, Mr. Stoddard has served as the special economic counsel to the Rhode Island House of Representatives for electricity restructuring and acted as overseer for Connecticut's standard offer energy auction; devised an energy trading strategy audit and strategy redesign for a major northeastern utility; conducted a comprehensive review of operating flaws within the structure of an ISO; designed a market-based transfer pricing system for the distribution, trading, and generation subsidiaries of a leading western utility; and managed the federal and state regulatory filings for several large utility mergers and asset sales.

Clients

Mr. Stoddard has been a consultant on electric market issues to a wide range of energy market stakeholders including ArcLight Capital Management, AES, American Wind Energy Association, Astoria Generating, Bangor Hydro Electric, California Independent System Operator, Citibank, City of New York, Connecticut Department of Public Utility Control, Consolidated Edison Co. of New York, Constellation Energy Commodities Group, CSG Investments, Dayton Power & Light, Devon Canada, Dominion, Duke Energy, Edison Mission Energy, EdF, Electricity Supply Board of Ireland, Emera, Energia dos Portugal, Energy Capital Partners, Energy East, Entergy Nuclear, FirstEnergy, FirstLight, GenOn, Hydro Québec, Independent Energy Producers Association, International Power, J. Aron & Company, Maine Energy Recovery Co., Maine Public Service, Midlands Cogeneration Venture, Morgan Stanley Capital Group, Morris Energy Group, New England Power Generators Association, New York City Economic Development Corporation, New York Energy Buyers Forum, NextEra Energy Resources, North American Energy Alliance, Northeast Utilities, NRG Energy, Orange & Rockland Utilities, Pepco Energy Services, Pinnacle West, PJM Power Providers, Portland General Electric, Powerex Corporation, Rhode Island Speaker and the House of Representatives, San Diego Gas & Electric, Southern California Edison, Sunoco, Tenaska, Tonbridge Power, USGen New England, USPowerGen, and Williams Power.

Strategy

- Led creation of business model and market-entry strategy for company developing an innovative renewable power technology.
- Led creation of business model and business plan for a combined wind-farm / transmission company in Canada.
- Assisted major utility in strategic and tactical plan to support transfer between Regional Transmission Organizations, providing both analytic and regulatory advisory support.
- Directed the development of the master energy infrastructure strategy for the City of New York, working with key stakeholders to develop a strategy to develop the infrastructure needed to meet the city's future energy needs economically and reliably.
- Developing a detailed forecasting model for capacity prices in PJM resulting from the new capacity market design and, using this information, worked with a major market participant's strategy and financing staff to identify under-valued assets for acquisition.
- With senior management of a major utility, developing a transmission investment strategy to reflect shifting competitive opportunities, RTO market design, and state and federal regulation. Identifying of key opportunities to leverage and redirect capital expenditures to significantly decrease cost of delivered power and increase rate of return to corporate shareholders.
- Developing a competitive bidding strategy for a complex hydroelectric generation asset to recognize opportunity costs, limitations of market rules, and effects of key transmission constraints in a two-settlement, locational pricing regime.
- Assisting a leading provider of utility outsourcing services to develop a comprehensive regulatory strategy for its service offerings to a major utility.

Electricity contracts and project valuation

- Testimony (in progress) to support the tax valuation of independent power production facilities in New York and Maryland, evaluating the free cash flows from sales of energy and other products' net of fuel, emissions, and other relevant costs.
- Testimony successfully supporting claims against industrial customer in breach-of-contract claims by a retail energy provider.
- Testimony supporting the cost-effectiveness of a long-term power purchase agreement between Cape Wind and National Grid in furtherance of Massachusetts policy goals.
- Testimony regarding the market value of a nuclear power facility excluding idiosyncratic nuclear risks using a comparable transactions analysis.
- Expert testimony supporting the reliability must-run (RMR) applications of over 2 GW of generation in New England, documenting need for RMR contracts to maintain the financial viability of needed resources. The case resulted in a settlement agreement that provided for significant support payments for these resources during the transition to compensatory market payments.

- Testimony for a bankruptcy court regarding damages arising from a power purchase agreement that had been rejected at the time of bankruptcy.
- Testimony in arbitration proceedings to determine the product specification and price of the capacity product contracted for in a period of regulatory change.
- Support of project financials for major purchase of New York City generation to investor community.
- Testimony in arbitration proceedings about the interpretation of, and damages owed under, the electricity section of a contract for the purchase of a large petrochemical refinery and resale of the refinery's output.
- State-appointed auditor of Connecticut's utilities' first Standard Offer power procurement auction, reviewing reasonableness of pricing and the terms and conditions of contract offers to supply essentially all of the state's power needs for a three-year period.
- Testimony on fuel costs adders reasonably allowable in a long-term power contract between NRG and Connecticut Light & Power and attendant retail rate design to fairly allocate the incremental costs.
- Assisting Consolidated Edison Co. of New York negotiate the sale of its nuclear facilities and linked buyback of power for the license life of the units.
- Working with Pinnacle West staff to develop options-based contracts to transfer power between its generating, trading, and distribution affiliates to preserve appropriate performance incentives.
- Project manager for bankruptcy evaluation of a New England cooperative, involving assessment of value of hydroelectric, nuclear assets, and long-term contracts.

Electricity market design

- Project director and testifying expert for capacity market design litigation and settlement negotiations for the New England and PJM markets, representing coalitions of the major generation owners in the region.
- Principal author of SDG&E and California Forward Capacity Market Advocates' proposal for a centralized capacity market structure to address resource adequacy needs of the California electricity markets. Subsequently offered a market-based approach to backstop capacity pricing in California on behalf of NRG Energy and the Independent Energy Producers Association.
- Working with other CRA experts, prepared a white paper on capacity market design for Energia dos Portugal.
- Principle drafter of the current form of the utility restructuring laws in Rhode Island, implementing improved retail market access.
- Project director for a major policy initiative by a major generation owner to review key flaws in modern RTO design that distort competitive pricing and outcomes.

- Project manager and testifying expert for litigation regarding the market rules governing use of phase angle regulators between New York and PJM. Subsequently, assisting the negotiated design of these rules pursuant to the FERC orders.
- In the redesign of the wholesale power market for the Republic of Ireland, responsible for development of rules regarding demand-side integration, interconnection management, financial transmission rights, and transmission loss representation.
- Testifying expert on behalf of a major importer into the California electricity market on the allocation of financial transmission rights across external interties.
- Project director for a review for the California Independent System Operator of transmission rights allocations in the proposed California wholesale market.

Market power analysis and mitigation

- Testifying expert successfully defending against charges of market manipulation by largest capacity importer to New England.
- Led preparation of report successfully defending against charges of market manipulation by a power marketer scheduling transactions through multiple jurisdictions.
- Lead expert defending a major financial institution against charges of manipulating ICE index markets (ongoing).
- Lead economist in team developing alternative mitigation measures for buyer-side market power in the New England capacity market.
- Testified on appropriate metrics for market power in PJM energy and capacity markets.
- Testifying expert and project director supporting the integration of Virginia Electric and Power (Dominion) into the PJM marketplace.
- Project manager for an acquisition of generation assets in Connecticut by a competing supplier, using detailed hourly analyses of power flows and potential future competition, and presenting the results to the FERC, US Department of Justice, and the Connecticut Office of the Attorney General.
- Project manager for a market power analyses needed to obtain federal and state regulatory approval of the merger of the leading natural gas transporter and distributor in the eastern US with a vertically integrated utility with substantial gas holdings.
- Project manager for study of the potential competitive effects of the divestiture of substantially all the New York City utility generation to independent power producers, including detailed behavioral modeling that took account of the complex transmission system and design of market power mitigation measures for the energy and capacity markets.

Articles

With Ed Kim, Todd Allmendinger and Richard Tabors, “Carbitrage: Utility Integration of Electric Vehicles and the Smart Grid,” *Electricity Journal*, March 2012 (forthcoming).

Testimony and reports

California Independent System Operator, Inc., FERC Docket No. ER12-897-000. Affidavit in support of protest by NRG Energy, Inc. of proposed waiver of provisions of the Capacity Procurement Mechanism, February 2012.

FirstEnergy Solutions Corp. & Allegheny Energy Supply Company, L.L.C. v PJM Interconnection, L.L.C., FERC Docket EL12-19-000. Affidavit in support of complaint seeking to fund Financial Transmission Rights solely from Day-Ahead Market settlement surplus, December 2011.

"Resource Adequacy in Ohio's Restructured Market," CRA report authored by Robert B. Stoddard, on behalf of Duke Energy Ohio, December 2011.

Bangor Hydro Electric Company and Maine Public Service Company Request for Exemptions and Reorganization Approvals, Maine Public Utilities Commission Docket No. 2011-170. Rebuttal testimony on behalf of Emera regarding potential horizontal and vertical market power issues of proposed acquisitions, September 2011; live testimony, December 2011.

PJM Interconnection, L.L.C., Duke Energy Ohio, Inc. and Duke Energy Kentucky, Inc., FERC Docket No. ER12-91-000. Affidavit on behalf of Duke providing cost-benefit analysis of its proposed transition from MISO to PJM in support of inclusion of transition costs in transmission rates, October 2011; rebuttal affidavit, November 2011.

In the Matter of Portland General Electric Company 2012 Annual Power Cost Update Tariff (Schedule 125), Oregon Public Utilities Commission Docket No. UE-228. Rebuttal testimony on behalf of Portland General Electric assessing reasonableness of its mid-term hedging strategy for gas and electricity procurement, August 2011.

California Independent System Operator Corporation, FERC Docket No. ER11-2256. Affidavit on behalf of the Independent Energy Producers Association protesting flawed elements of the Capacity Procurement Mechanism, December 2010; presentation to FERC Technical Conference, March 2011.

Expert Report on behalf of Mirant Mid-Atlantic, LLC, Maryland Tax Court Case Nos. 09-RP-CH-261-265; 09-RP-CH-280-294; and 09-RP-CH-294-298, July 2010; live testimony, February 2011.

PJM Interconnection, LLC, FERC Docket No. ER11-2288. Affidavit on behalf of GenOn Energy Management, LLC and Edison Mission Energy protesting the creation of a summer-only demand resource capacity product and the continuation of a limited demand resource capacity product in the PJM Reliability Pricing Model, December 2010.

Testimony on behalf of the PJM Power Providers before the Maryland Public Service Commission in Administrative Docket PC22 regarding the PJM Reliability Pricing Model and the 2013/2014 Delivery Year Base Residual Auction Results, October 2010.

ISO New England Inc. and New England Power Pool, FERC Docket No. ER10-787-000, and *New England Power Generators Association v. ISO New England, Inc.*, FERC Docket No. EL10-50-000 (combined). Affidavit on behalf of New England Power Generators Association supporting need for revisions to Forward Capacity Market design, March 2010. Rebuttal affidavit, April 2010. Pre-filed testimony, July 2010; supplemental affidavits, September 2010.

Petition of Massachusetts Electric Company and Nantucket Electric Company each d/b/a National Grid for Approval of Proposed Long-Term Contracts for Renewable Energy with Cape Wind Associates, LLC Pursuant to St. 2008, c. 169, § 83, Massachusetts D.P.U. Docket No. 10-54. Direct testimony on behalf of Cape Wind Associates, LLC, June 2010.

Richard Blumenthal, Attorney General for The State of Connecticut v. ISO New England Inc., Brookfield Energy Marketing Inc., et al. FERC Docket No. EL09-47-000, and *The Connecticut Department of Public Utility Control and the Connecticut Office of Consumer Counsel v. ISO New England Inc., Brookfield Energy Marketing Inc., et al.*, FERC Docket No. EL09-48-000. Prefiled testimony on behalf of Brookfield Energy Marketing Inc. regarding scheduling of capacity imports. June 2009. Answering testimony, February 2010.

Pepco Energy Services, Inc. v. Constellation Energy Commodities Group, Inc. (ad hoc arbitration); expert report on behalf of Constellation on alleged mis-payment under a bilateral contract for PJM capacity, April 2008; testimony, October 2009.

Application of MidAmerican Energy Company for the Determination of Ratemaking Principles, IUB Docket No. RPU-2009-0003. Rebuttal testimony on behalf of NextEra Energy Resources, June 2009; surrebuttal testimony, July 2009, live testimony, August 2009.

Midwest Independent Transmission System Operator Inc., FERC Docket Nos. ER08-394-007 and -009. Affidavit regarding monitoring and mitigation of resource adequacy auctions on behalf of Duke Energy Corp., July 2009.

Calpine Corporation, Citigroup Energy Inc., Dynegy Power Marketing, Inc., J.P. Morgan Ventures Energy Corporation, BE CA, LLC, Mirant Energy Trading, LLC, NRG Energy, Inc., Powerex Corporation, and RRI Energy, Inc. v. California Independent System Operator Corp., FERC Docket No. EL09-62-000. Affidavit on behalf of complainants, June 2009; reply affidavit, July 2009.

Report on ISO New England Internal Market Monitoring Unit Review of the Forward Capacity Market Auction Results and Design Elements, prepared for New England Power Generators Association, Inc. and filed in *ISO New England, Inc.*, FERC Docket No. ER09-1282-000 (June 2009).

Richard Blumenthal, Attorney General for Connecticut, v. ISO New England Inc. et al., FERC Docket Nos. EL09-47-000 and EL09-48-000. Prefiled testimony on behalf of Brookfield Energy Marketing Inc. regarding scheduling of capacity imports, June 2009.

Master Transmission Plan for New York City, report prepared for the New York City Economic Development Corporation, April 2009.

California Independent System Operator Corporation, FERC Docket No. ER09-589-000. Affidavit on behalf of Powerex Corp. regarding changes to the CAISO credit policy regarding unsecured credit, February 2009.

"Contracting and Investment: A Cross-Industry Assessment" report filed with Post-Conference Comments of Reliant Energy, Inc., *Credit and Capital Issues Affecting the Electric Power Industry*, FERC Docket No. AD09-002-000, January 2009.

PJM Interconnection, LLC FERC Docket No. ER09-412-000. Affidavit and reply affidavit on behalf of Mirant, Edison Mission Energy, International Power, and FPL (NextEra Energy Resources) regarding omnibus changes to the PJM RPM capacity market tariff, January 2009.

Midwest Independent System Transmission Operator, Inc. FERC Docket Nos. ER08-394-000, -003, -007. Affidavit on behalf of Duke Energy protesting the market monitoring standards proposed for the voluntary capacity auction in Midwest ISO, January 2009.

Devon Canada Corp. et al. v. Pittsfield Generating Company LP et al. Expert report for defendant regarding damages from alleged breach of natural gas supply contract to a reliability must-run electric generator, December 2008.

Maryland Public Service Commission v. PJM Interconnection, LLC, FERC Docket Nos. EL08-34-000 and EL08-47-000. Affidavit on behalf on Mirant Parties on appropriate structural and behavioral market power tests in PJM, October 2008; reply affidavit, November 2008.

ISO New England, Inc., FERC Docket No. ER08-1209-000. Affidavit on behalf of the New England Power Generation Association on compensation to reliability resources, July 2008; reply affidavit, September 2008.

Midwest Independent Transmission System Operator, Inc. FERC Docket No. ER08-1169-000. Affidavit on behalf of FPL Energy, LLC, regarding revisions to Generation Interconnection Procedures, July 2008.

RPM Buyers v. PJM Interconnection, LLC, FERC Docket No. EL08-67-000. Affidavit on behalf of PJM Power Providers opposing *ex post* changes to initial RPM auction results, June 2008.

Assessment of Maine's Continued Participation in ISO New England and Alternatives, Expert report in Maine Public Utilities Commission Docket No. 2008-156, prepared on behalf of Bangor Hydro-Electric Company, June 2008; testimony to the MPUC, October 2008.

"Reliability at Stake: PJM's Reliability Pricing Model" report prepared for PJM Power Providers in conjunction with FERC technical conference to discuss the operation of forward capacity markets in New England and the PJM region, FERC Docket No. AD08-4-000, May 2008.

Estimation of Indian Point 2 Fair Market Value Using a Statistical Analysis of Comparable Transactions, Testimony in *Consolidated. Edison Co. of New York v. United States*, No. 04-0033C (Fed.Cl.), February 2008.

Critique of the APPA/CMU Study "Do RTOs Promote Renewables?" (with David Riker) commissioned by Electric Power Supply Association, January 2008.

Midwest Independent Transmission System Operator, Inc. Electric Tariff Failing Regarding Resource Adequacy, FERC Docket No. ER08-394-000. Affidavit on behalf of Duke Energy Corp. and FirstEnergy Services Co. on the urgency of implementing a uniform resource adequacy requirement, January 2008.

Mirant Energy Trading, LLC, et al. v PJM Interconnection, LLC, FERC Docket No. EL08-8-000. Affidavit on the flaws in the market power mitigation rules for the Third Incremental Auction of the PJM Reliability Pricing Model capacity market., November 2007.

Wholesale Competition in Regions with Organized Electric Markets, FERC Docket Nos. RM07-19-000 and AD07-7-000. Affidavit on role of demand-side resources in organized electric markets on behalf of Duke Energy Corp., September 2007.

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PJM Interconnection, LLC, FERC Docket Nos. EL03-236-000 *et al.* Affidavit regarding three-pivotal-supplier market power test and scarcity pricing in PJM's energy markets on behalf of Mirant Energy Trading et al., May 2007.

Midwest Independent Transmission System Operator, FERC Docket No. ER07-550-000. Affidavit regarding resource adequacy issues in ancillary services market design on behalf of Duke Energy Co., March 2007.

PJM Interconnection LLC, FERC Docket No. EL05-148-000 *et al.* Affidavit regarding redesign of the long-run resource adequacy market in PJM on behalf of the Mirant Parties, October 2005; supplemental affidavit on behalf of the Mirant Parties, NRG and Williams Power Co., November 2005; presentation to FERC Technical Conference, February 2006; prefiled comments to FERC Technical Conference Panel 1, May 2006, on behalf of the Mirant Parties, Williams Power Co., and Dayton Power & Light; prefiled comments to FERC Technical Conference Panel 2, May 2006, on behalf of the Mirant Parties; supplemental affidavit on behalf of the Mirant Parties, June 2006; affidavit and reply affidavit supporting settlement agreement, September and October 2006.

Mystic Development, LLC, FERC Docket No. ER06-427-000. Affidavit analyzing future revenues in support of RMR filing, December 2005; supplemental affidavit, September 2006.

In re USGen New England, Inc. Debtor. United States Bankruptcy Court for the District of Maryland, Case No. 03-30465. Expert report on damage resulting from PPA rejection on behalf of USGen New England, March 2006; supplemental report, September 2006.

California Independent System Operator Corporation, FERC Docket No. ER06-615-000. Joint affidavit with Paul Kevin Wellenius regarding FTR allocations under new CAISO market design on behalf of Powerex Corp, June 2006

Fore River Development, LLC, FERC Docket No. ER06-822-000. Affidavit analyzing future revenues in support of RMR filing, December 2005.

Assessment of the New York City Electricity Market and Astoria, Gowanus, and Narrows Generating Stations. Report prepared for Morgan Stanley Senior Funding, Inc. related to financing for US Power Generating Co. and Madison Dearborn Capital Partners IV, L.P., January 2006.

Review of Initial Execution of Protocol for Implementation of Commission Order No. 476. Report to FERC in Docket EL02-23-000, regarding operation of controllable lines between NYISO and PJM, on behalf of Con Edison, September and December 2005.

Honeywell International Inc. v. Sunoco, Inc. AAA Case No. 13 181 Y 02588 04. Expert report, deposition and live testimony on contract energy pricing in petrochemicals, May 2005.

Con Edison Energy, Inc. v. ISO New England, Inc. and New England Power Pool, FERC Docket No. EL05-61-000. Affidavit on behalf of complainant regarding bidding rules in capacity deficiency auction, February 2005.

KeySpan Ravenswood LLC v. New York Independent System Operator, Inc., FERC Docket No. EL05-17-000. Affidavit on behalf of Consolidated Edison Company of New York, Inc. regarding retroactive damage claims from a capacity market, November 2004.

Devon Power LLC et al., FERC Docket No. ER03-563-030. Affidavit and rebuttal affidavit regarding design of locational installed capacity markets on behalf of FPL Energy, April and May 2004; answering testimony on behalf of Capacity Suppliers, November 2004; cross-answering testimony, December 2004; supplemental cross-answering testimony, January 2005; deposition and hearing testimony, February to March 2005; affidavit supporting Settlement Agreement, March 2006.

Application of Dominion North Carolina Power to Join PJM as PJM South, North Carolina Utilities Commission, Case No. E-22 SUB 418. Direct testimony and cost-benefit study on behalf of applicant, April 2004; rebuttal testimony, December 2004; examination, January 2005.

Application of Virginia Electric and Power Company to Join PJM as PJM South, State Corporation Commission of Virginia Case No. PUE-2000-00551; direct testimony and cost-benefit study on behalf of applicant, June 2003; supplemental direct testimony, March 2004; rebuttal testimony, September 2004; examination, October 2004.

Consolidated Edison v. Public Service Electric and Gas Co. et al., FERC Docket No. EL02-23-000 (Phase II); direct testimony on behalf of Consolidated Edison Company of New York, Inc., June 2002 regarding transmission facilities contracts. Remand testimony, January to March 2003.

In the Matter of the Siting of Electric Transmission Facilities Proposed to be Located at the West 49th Street Substation of Consolidated Edison Company of New York, Inc. et al., New York State Public Service Commission Case Nos. 02-M-0132, 01-T-1474, 02-T-0036, 02-T-0061; testimony on behalf of Consolidated Edison Company of New York, Inc., April 2002 (direct) and May 2002 (rebuttal).

Testimony before the Rhode Island Special Legislative Commission on the Quonset-Davisville Steamplant, January and April 2002.

Testimony before the Committee on Corporations, Rhode Island House of Representatives, regarding 2002 House Bill 7786, *An Act Relating to Public Utilities and Carriers,* April 2002.

Keyspan-Ravenswood, Inc. v. New York Independent System Operator, FERC Docket No. EL02-59-000, direct testimony on behalf of Consolidated Edison Company of New York, Inc. regarding implementation of market power mitigation in installed capacity markets, March 2002.

DPUC Investigation Into Viability of Power Supply Contracts to the Connecticut Light and Power Company and the United Illuminating Company, Connecticut DPUC Docket No. 01-12-05, direct testimony on behalf of NRG Energy, Inc. and affiliates, February 2002.

Joint Study by the Department of Public Utility Control and the Office of the Consumer Counsel Regarding Electric Deregulation and How Best to Provide Electric Default Service After January 1, 2004, Connecticut DPUC Docket No. 01-12-06, direct testimony on behalf of NRG Energy, Inc. and affiliates, January 2002.

The Narragansett Electric Co. Rate Changes for January 1, 2002, Rhode Island PUC Docket No. 3402, direct testimony on behalf of the Hon. John B. Harwood, Speaker of the House of Representatives, State of Rhode Island and Providence Plantations, December 2001.

Wisvest-Connecticut, LLC et al., FERC Docket No. EC01-70-000, technical conference presentation on behalf of NRG Energy, Inc. and affiliates, September 2001.

New York Independent System Operator, Inc., FERC Docket No. ER01-2536-000, affidavit on behalf of Consolidated Edison Co. of New York, the City of New York, the New York Energy Buyers Forum, and the Association for Energy Affordability, Inc., July 2001.

Testimony before the Committee on Corporations, Rhode Island House of Representatives regarding electricity restructuring; various dates, 2001.

Consolidated Edison Co. of New York, Inc., FERC Docket Nos. EL01-45-000 and ER01-1385-000, affidavit and rebuttal affidavit (joint with William H. Hieronymus) on behalf of Consolidated Edison Co. of New York, March and April, 2001.

Joint Petition of Consolidated Edison Co. of New York, Inc. and Entergy Nuclear Indian Point 2, LLC, for Authority to Transfer Certain Generating and Related Assets and for Related Relief, NYSPSC Case 01-E-0040, technical conference presentation on behalf of applicants, February 2001.

Professional history

2009–Present	*Vice President and Practice Leader*, Charles River Associates, Boston, MA
2003–2009	*Vice President*, Charles River Associates, Boston, MA
2001–2003	*Principal*, Charles River Associates, Boston, MA
1995–2001	*Managing Consultant*, PA Consulting Group, Cambridge, MA PA purchased PHB Hagler Bailly, formed by the merger of Hagler Bailly and Putnam, Hayes & Bartlett, where Mr. Stoddard had been a Principal.
1993–1995	*Senior Health Economist and Acting Managing Director*, Benefit Research USA, a Quintiles company, Cambridge, MA
1990–1993	*Senior Associate*, Charles River Associates, Boston, MA
1985–1990	*Teaching and Research Fellow*, Department of Economics, Yale University
1983–1985	*Assistant Economist*, Federal Reserve Bank of New York