

Affidavit of Ezra D. Hausman, Ph.D.

**UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION**

PJM Interconnection, L.L.C.) Docket No. ER05-1410-000 and EL05-148-000

**AFFIDAVIT OF EZRA D. HAUSMAN, Ph.D.
ON BEHALF OF COALITION OF CONSUMERS FOR RELIABILITY**

1 I. Introduction and Qualifications

2 My name is Ezra D. Hausman, Ph.D., and I am a Senior Associate at Synapse
3 Energy Economics (“Synapse”). Synapse is a research and consulting firm specializing in
4 energy and environmental issues, including electric generation, transmission and
5 distribution system reliability, market design, market power analysis, pricing of
6 electricity, stranded costs, efficiency, renewable energy, environmental quality, and
7 nuclear power.

8 I have worked as a consultant in the electric power industry since 1998,
9 performing a wide range of market analysis, price forecasting and asset valuation studies
10 for clients in the public, private and nonprofit sectors. These studies have included long-
11 range price forecasting studies for a number of purposes, including analysis of proposed
12 capacity investments, contract valuation and liquidation studies, market power studies,
13 market transition cost/benefit studies and market design support. I have testified or
14 assisted in the preparation of testimony in a wide range of civil and regulatory cases. In
15 addition to this analytical work, I have spoken at and led several seminars on electricity
16 pricing and hedging transmission cost risk in electricity markets. I have also published
17 peer-reviewed papers on topics related to pricing of electricity and transmission services,
18 and on electricity market dynamics.

19 I hold a Bachelor of Arts degree from Wesleyan University, a Master of Science
20 Degree in Environmental Engineering from Tufts University, a Master of Science degree
21 from Harvard University in Applied Physics, and a Ph.D. from Harvard University in
22 Earth and Planetary Science.

1 I am submitting this affidavit in response to PJM’s proposed Reliability Pricing
2 Model (“RPM”), to express certain concerns I have regarding the structure of the
3 Variable Resource Requirement (VRR) curve underlying the setting of capacity priced in
4 PJM. The concerns that I am detailing here have to do with the process for setting the
5 parameters of the VRR curve, which has undergone remarkably little review considering
6 the enormous implications for costs to consumers. I also discuss a few details of the
7 underlying calculations which are arbitrary at best and unrealistic at worst, again to the
8 considerable detriment of consumers.

9 Please note that I have a large number of concerns about the proposed RPM
10 system, which I see as a poorly targeted, and very possibly ineffective, non-market
11 approach to ensuring reliability, at great expense to electricity consumers. I have
12 addressed and will continue to address those concerns in other venues. However, the
13 comments in this affidavit will be restricted to some serious issues regarding the
14 calculation of the proposed VRR curve.

15 The exact definition of the VRR curve is a fundamental aspect of the
16 determination of the capacity price under RPM. This is because RPM is designed to
17 produce a particular long-term price for capacity, equal to the annualized all-in cost of a
18 new peaking plant minus the revenues such a plant would be expected to earn in the
19 energy and ancillary services market. Under conditions of shortage, RPM is designed to
20 produce a price up to *twice* the cost of such a plant, again net of expected revenues. I will
21 leave aside for now the important question of whether a market operator should even be
22 setting a price in a supposedly competitive market, and whether it makes sense to have a
23 single clearing price for all capacity, whether or not it is profitable in the energy market
24 and/or has already been funded by ratepayers. The question I focus on is, how can you
25 reasonably determine the cost of a hypothetical peaking unit without relying on market
26 forces to minimize cost to consumers?

27 PJM takes the approach of calling on its experts, Raymond L. Pasteris and Joseph
28 E. Bowring, to advise them on the costs and revenues, respectively, to be expected for
29 such a plant. While I do not question these experts’ qualifications, I find it troubling that

1 PJM would eliminate any opportunity for the market to find more efficient solutions than
2 the “typical” values their experts determine. These experts have no incentive whatsoever
3 to minimize costs to consumers. They are also in the impossible position of making
4 decisions for the design of a purely hypothetical peaking plant, where every minor
5 judgment call can add up to hundreds of millions of dollars in costs to consumers. The
6 number of judgment calls is considerable, and the inherent uncertainty in making them is
7 enormous. Under these circumstances, each detail should be subject to thorough review
8 and the benefit of the doubt should accrue to consumers. Under PJM’s proposal thus far,
9 neither of these is the case.

10 **II. Setting of Financial Model Parameters**

11 In order to calculate the all-in cost of a peaking plant, Mr. Pasteris is required to
12 use a financial model with a set of assumptions for financing terms, discount rate, internal
13 rate of return, and other parameters. Those of us involved in economic analysis of energy
14 markets set up and apply such models on a regular basis. I have not had an opportunity to
15 review the underlying details of Mr. Pasteris’ financial model, but I have no reason to
16 believe that the particular parameters he has used are in error. What I do take strong issue
17 with is the *application* of the model in this case.

18 Forecast models are properly used to evaluate investments, to compare
19 alternatives, and to engage in long-term planning and risk management. They are
20 inappropriate for price-setting applications such as this one, for two very good reasons.
21 First, they involve substituting an expert’s opinion for the reality of the market, even
22 though an expert forecast is always, by definition, inaccurate. Second, once the expert has
23 made certain judgments based on his or her understanding of the fundamentals, there is
24 no opportunity or incentive for the market to find a better solution. Because of these
25 realities, a thorough modeling exercise should include uncertainty analysis and
26 consideration of alternative scenarios. Models are properly used to forecast what the
27 future might hold, acknowledging that considerable uncertainty always remains. Because
28 of this inherent uncertainty, however, they are simply not well suited for the application
29 to which they have been put in this case.

1 As an example of the ambiguity of this sort of model application, I consider Mr.
2 Pasteris' use of a 12% Internal Rate of Return (IRR) for a 20-year project life in
3 evaluating the proxy plant. This value may be reasonable, but one could just as
4 reasonably use different assumptions and come up with an 11% IRR, decreasing system-
5 wide RPM payments by 8.3%. How can it be that such an arbitrary judgment call on
6 financing a hypothetical power plant can mean hundreds of millions of dollars saved or
7 lost by consumers? Why is it necessary to assume that this hypothetical peaker would be
8 paid down in 20 years? Why not in 30? This is far too much leverage on what I presume
9 even Mr. Pasteris would agree are uncertain and somewhat arbitrary parameters. Any
10 financial model contains many such parameters which cannot be determined with
11 precision; in this case, the inherent uncertainty translates into enormous, arbitrarily
12 imposed costs on consumers.

13 **III. Gold-Plating the Proxy Peaker**

14 In addition to the myriad opportunities for arbitrary judgments in the financial
15 model, this particular case makes the unusual demand that the expert identify and design
16 a "proxy" peak load-serving plant to represent potential new entry in PJM. This
17 completely eliminates opportunities for the marketplace to find the most efficient
18 solutions. To the contrary, the plant identified by Mr. Pasteris appears to have some
19 features that are completely out of step with market realities, and that have costs which
20 cannot be reconciled with those of actual generating plants in service in PJM.

21 Two examples of particular concern are the decisions to include expensive
22 pollution control, and the inclusion of fuel-switching capability for the hypothetical proxy
23 plant. Because of the low capacity factor of the resources this proxy represents, these
24 costs are simply not realistic—in fact, Mr. Pasteris himself shows that they have not been
25 implemented on any of the real peaking plants he identifies in PJM. The unrealistic
26 inclusion of these technologies on the hypothetical units would cost consumers hundreds
27 of millions of dollars per year. No owner of a peaking plant that runs only a few hours
28 per year would invest in SCRs when it would be much more economical to simply
29 purchase emission allowances for those few hours. And while fuel switching capability
30 may make sense in some regions, to imply that it would be included in any new peaking

1 plant in PJM defies credulity. If I were advising a developer who was considering
2 investing in a peaking plant, I would at least perform a thorough analysis of the costs and
3 benefits of each of these expensive technologies; I would expect that in most cases,
4 neither would be justified.

5 Mr. Pasteris, of course, is not making this recommendation to anyone who will
6 actually have to pay for building a plant. Consumers, on the other hand, would have to
7 pay dearly for this technology through capacity payments, though they will receive no
8 commensurate benefits. Under RPM as currently proposed, consumers would end up
9 paying the price of SCRs on proxy peakers hundreds of times over, but when the real
10 units are built this technology is unlikely to be included.

11 On page 24 of his affidavit, Mr. Pasteris compares his projected peaker cost to the
12 “cost of recently constructed CT projects.” He finds that the proposed proxy plant costs
13 are *higher* by \$67 to \$75 per kw than the average of recent real plants. Mr. Pasteris
14 explains this by noting that *none* of these plants had SCRs or dual fuel capability, which
15 together explain about \$50 of this difference. He then goes on to claim that this
16 “compares closely” to actual costs.

17 This leaves many more questions open than answered, however. How is it
18 reasonable to include technology in the proxy that no real peaker would include? What
19 about the missing \$17 to \$25 per kw, which is hardly insignificant given the enormous
20 financial implications of every penny in proxy costs?

21 The unexplained \$75 in increased costs represents 15.8% of the capital cost of the
22 proxy peaker. This translates into an unexplained \$11,700 per MW per year in capacity
23 payments at the RPM target price, and up to twice that in times of shortage. Given a PJM
24 footprint that includes about 164,000 MW of capacity, this unexplained discrepancy
25 would cost PJM consumers over \$1.9 billion *per year* in additional capacity payments at
26 the RPM target price, and again up to twice this, or up to \$3.8 billion per year, at the
27 RPM maximum, purely because the proxy peaker price is \$75/kw too high relative to
28 historical standards. It does not appear that this extremely expensive discrepancy has ever
29 been adequately reviewed.

1 IV. General Conclusions

2 Among the many shortcomings of the RPM proposal, the arbitrary and unjustified
3 setting of model parameters, with very real cost implications for consumers, may be the
4 most troubling. Consumers should not be exposed to billions of dollars of costs based on
5 a particular modeling exercise, without any real opportunity to review and challenge each
6 of the assumptions as well as the underlying approach.

7 A thorough review of all model inputs and consideration of alternative scenarios
8 is essential before RPM can be allowed to go forward. I understand that this would be
9 problematic due to PJM's desire for immediate FERC approval of its RPM filing.
10 Inconvenience, however, is no reason to pretend that uncertainty does not exist, or to turn
11 a blind eye to arbitrary decisions with huge implications. In one sense, this is an
12 illustration of how administrative price setting under the guise of competitive markets,
13 even when based on expert opinion, is simply a bad idea. But the more immediate
14 concern is that RPM must not be allowed to go forward based on incomplete analysis,
15 inadequate review, and unjustified costs to consumers.

16 This concludes my affidavit.