

**UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION**

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In re:

License Renewal Application Submitted by

Entergy Nuclear Indian Point 2, LLC,  
Entergy Nuclear Indian Point 3, LLC, and  
Entergy Nuclear Operations, Inc.

Docket Nos. 50-247-LR, 50-286-LR

ASLBP No. 07-858-03-LR-BD01

DPR-26, DPR-64

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DECLARATION OF DAVID A. SCHLISSEL

David A. Schlissel, hereby declares under penalty of perjury that the following is true and correct:

1. I am a senior consultant at Synapse Energy Economics, Inc. (Synapse), an energy and economic consulting firm located in Cambridge, Massachusetts.

2. Synapse has been retained by the New York State Office of the Attorney General to provide expert services to the State of New York concerning the proposed relicensing of the two operating reactors located at the Indian Point Nuclear Power Station in the Village of Buchanan in Westchester County (Indian Point Unit 2 and Indian Point Unit 3).

3. When it is in service, Indian Point Unit 2 can produce up to 1,028 MW per year; Indian Point Unit 3 can produce up to 1,041 MW when it is in service. The Indian Point nuclear reactors, however, cannot run indefinitely. Approximately every 24 months, each reactor is taken off line for refueling and maintenance work. According to the Entergy's recent investor report, over the last two years, planned outages for maintenance and refueling at Indian Point Unit 2 and Unit 3 have lasted approximately three to four weeks (24 to 31 days). See Entergy Statistical Report and Investor Guide 2006, p. 52. In addition, from time to time, each unit may experience unplanned outages.

4. Attached hereto and made a part of this sworn statement is a report prepared by me concerning readily-available means to replace the power generated by Indian Point Unit 2 and/or Indian Point Unit 3. This report examines the availability of: (1) energy conservation and efficiency measures; (2) repowering of existing power plants; (3) renewable energy resources; (4) certain transmission system upgrades and enhancements; and (5) the potential for the addition of new generating facilities. See Synapse Energy Economics, Inc., "Report on the Availability of Replacement Capacity and Energy for Indian Point Units 2 and 3" (November 28, 2007).

5. To prepare the attached report, my staff and I have examined various publicly-available information, including, but not limited to, reports prepared by the

New York State Energy Research and Development Authority, the New York Independent System Operator, the New York State Department of Public Service, the U.S. Department of Energy, the U.S. Nuclear Regulatory Commission, Levitan & Associates for the County of Westchester, the New York State Reliability Council, and the National Academy of Sciences. I also examined the April 30, 2007 License Renewal Application filed by Entergy, the accompanying Environmental Report, and the Entergy Statistical Report and Investor Guide 2006.

6. The report that I prepared concludes that the capacity and energy provided by Indian Point Units 2 and 3 can be replaced if the Units are not relicensed. In particular, energy efficiency, renewable resources, the repowering of older generating facilities, transmission upgrades and new natural gas-fired generating facilities represent viable alternatives to the relicensing of Indian Point. Substantial reductions in peak demand and energy requirements will be achieved by 2013 under the state's newly announced "15 by 15" Clean Energy Plan. Significant amounts of new renewable resources will be available as a result of the state's renewable energy portfolio standard and other initiatives. In addition, thousands of megawatts ("MW") of new generating capacity can be provided by the repowering (i.e., rebuilding) of older generating facilities both along the Hudson River and in the downstate area of the state in New York City and on Long Island. At the same time, transmission system upgrades also can increase the amounts of

power that can provided to the downstate region of the State. Finally, there is the potential for the addition of several thousand megawatts of new generating capacity in the Hudson River Valley and in downstate New York.


7. Also attached hereto is a copy of my current Curriculum Vitae (CV).

8. The report and CV are true and correct to the best of my personal knowledge.

9. Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct.

Dated:

November 28, 2007  
Cambridge, Massachusetts

  
David A. Schlissel

# David A. Schlissel

Senior Consultant  
Synapse Energy Economics  
22 Pearl Street, Cambridge, MA 02139  
(617) 661-3248 ext. 224 • Fax: (617) 661-0599  
www.synapse-energy.com  
dschlissel@synapse-energy.com

## SUMMARY

I have worked for thirty years as a consultant and attorney on complex management, engineering, and economic issues, primarily in the field of energy. This work has involved conducting technical investigations, preparing economic analyses, presenting expert testimony, providing support during all phases of regulatory proceedings and litigation, and advising clients during settlement negotiations. I received undergraduate and advanced engineering degrees from the Massachusetts Institute of Technology and Stanford University, respectively, and a law degree from Stanford Law School

## PROFESSIONAL EXPERIENCE

**Electric System Reliability** - Evaluated whether new transmission lines and generation facilities were needed to ensure adequate levels of system reliability. Investigated the causes of distribution system outages and inadequate service reliability. Examined the reasonableness of utility system reliability expenditures.

**Transmission Line Siting** – Examined the need for proposed transmission lines. Analyzed whether proposed transmission lines could be installed underground. Worked with clients to develop alternate routings for proposed lines that would have reduced impacts on the environment and communities.

**Power Plant Operations and Economics** - Investigated the causes of more than one hundred power plant and system outages, equipment failures, and component degradation, determined whether these problems could have been anticipated and avoided, and assessed liability for repair and replacement costs. Examined power plant operating, maintenance, and capital costs. Analyzed power plant operating data from the NERC Generating Availability Data System (GADS). Evaluated utility plans for and management of the replacement of major power plant components. Assessed the adequacy of power plant quality assurance and maintenance programs. Examined the selection and supervision of contractors and subcontractors.

**Power Plant Repowering** - Evaluated the environmental, economic and reliability impacts of rebuilding older, inefficient generating facilities with new combined cycle technology.

**Power Plant Air Emissions** – Investigated whether proposed generating facilities would provide environmental benefits in terms of reduced emissions of NO<sub>x</sub>, SO<sub>2</sub> and CO<sub>2</sub>. Examined whether new state emission standards would lead to the retirement of existing power plants or otherwise have an adverse impact on electric system reliability.

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**Power Plant Water Use** – Examined power plant repowering as a strategy for reducing water consumption at existing electric generating facilities. Analyzed the impact of converting power plants from once-through to closed-loop systems with cooling towers on plant revenues and electric system reliability. Evaluated the potential impact of the EPA’s Proposed Clean Water Act Section 316(b) Rule for Cooling Water Intake Structures at existing power plants.

**Nuclear Power** - Examined the impact of the nuclear power plant life extensions and power uprates on decommissioning costs and collections policies. Evaluated utility decommissioning cost estimates and cost collection plans. Examined the reasonableness of utility decisions to sell nuclear power assets and evaluated the value received as a result of the auctioning of those plants. Investigated the significance of the increasing ownership of nuclear power plants by multiple tiered holding companies with limited liability company subsidiaries. Investigated the potential safety consequences of nuclear power plant structure, system, and component failures.

**Electric Industry Regulation and Markets** - Investigated whether new generating facilities that were built for a deregulated subsidiary should be included in the rate base of a regulated utility. Evaluated the reasonableness of proposed utility power purchase agreements with deregulated affiliates. Investigated the prudence of utility power purchases in deregulated markets. Examined whether generating facilities experienced more outages following the transition to a deregulated wholesale market in New England. Evaluated the reasonableness of nuclear and fossil plant sales, auctions, and power purchase agreements. Analyzed the impact of proposed utility mergers on market power. Assessed the reasonableness of contract provisions and terms in proposed power supply agreements.

**Economic Analysis** - Analyzed the costs and benefits of energy supply options. Examined the economic and system reliability consequences of the early retirement of major electric generating facilities. Evaluated whether new electric generating facilities are used and useful. Quantified replacement power costs and the increased capital and operating costs due to identified instances of mismanagement.

**Expert Testimony** - Presented the results of management, technical and economic analyses as testimony in more than ninety proceedings before regulatory boards and commissions in twenty three states, before two federal regulatory agencies, and in state and federal court proceedings.

**Litigation and Regulatory Support** - Participated in all aspects of the development and preparation of case presentations on complex management, technical, and economic issues. Assisted in the preparation and conduct of pre-trial discovery and depositions. Helped identify and prepare expert witnesses. Aided the preparation of pre-hearing petitions and motions and post-hearing briefs and appeals. Assisted counsel in preparing for hearings and oral arguments. Advised counsel during settlement negotiations.

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## **TESTIMONY, AFFIDAVITS, DEPOSITIONS AND COMMENTS**

### **West Virginia Public Service Commission (Case No. 06-0033-E-CN) – November 2007**

Appalachian Power Company's application for a Certificate of Public Convenience and Necessity for a 600 MW integrated gasification combined cycle generating facility.

### **Iowa Utility Board (Docket No. GCU-07-01) – October 2007**

Whether Interstate Power & Light Company's adequately considered the risks associated with building a new coal-fired power plant and whether that Company's participation in the proposed Marshalltown plant is prudent.

### **Virginia State Corporation Commission (Case No. PUE-2007-00066) – November 2007**

Whether Dominion Virginia Power's adequately considered the risks associated with building the proposed Wise County coal-fired power plant and whether that Commission should grant a certificate of public convenience and necessity for the plant.

### **Louisiana Public Service Commission (Docket No. U-30192) – September 2007**

The reasonableness of Entergy Louisiana's proposal to repower the Little Gypsy Unit 3 generating facility as a coal-fired power plant.

### **Arkansas Public Service Commission (Docket No. 06-154-U) – July 2007**

The probable economic impact of the Southwestern Electric Power Company's proposed Hempstead coal-fired power plant project.

### **North Dakota Public Service Commission (Case Nos. PU-06-481 and 482) – May 2007**

Whether the participation of Otter Tail Power Company and Montana-Dakota Utilities in the Big Stone II Generating Project is prudent.

### **Indiana Utility Regulatory Commission (Cause No. 43114) – May 2007**

The appropriate carbon dioxide ("CO<sub>2</sub>") emissions prices that should be used to analyze the relative economic costs and benefits of Duke Energy Indiana and Vectren Energy Delivery of Indiana's proposed Integrated Gasification Combined Cycle Facility and whether Duke and Vectren have appropriately reflected the capital cost of the proposed facility in their modeling analyses.

### **Public Service Commission of Wisconsin (Docket No. 6630-EI-113) – March 2007**

Whether the proposed sale of the Point Beach Nuclear Plant to FPL Energy Point Beach, LLC, is in the interest of the ratepayers of Wisconsin Electric Power Company.

### **Florida Public Service Commission (Docket No. 070098-EI) – March 2007**

Florida Light & Power Company's need for and the economics of the proposed Glades Power Park.

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**Michigan Public Service Commission (Case No. 14992-U) – December 2006**

The reasonableness of the proposed sale of the Palisades Nuclear Power Plant.

**Minnesota Public Utilities Commission (Docket No. CN-05-619) – November 2006**

Whether the co-owners of the proposed Big Stone II coal-fired generating plant have appropriately reflected the potential for the regulation of greenhouse gases in their analyses of the facility; and whether the proposed project is a lower cost alternative than renewable options, conservation and load management.

**North Carolina Utilities Commission (Docket No. E-7, Sub 790) – September 2006 and January 2007**

Duke's need for two new 800 MW coal-fired generating units and the relative economics of adding these facilities as compared to other available options including energy efficiency and renewable technologies.

**New Mexico Public Regulatory Commission (Case No. 05-00275-UT) – September 2006**

Report to the New Mexico Commission on whether the settlement value of the adjustment for moving the 141 MW Afton combustion turbine merchant plant into rate base is reasonable.

**Arizona Corporation Commission (Docket No. E-01345A-0816) – August and September 2006**

Whether APS's acquisition of the Sundance Generating Station was prudent and the reasonableness of the amounts that APS requested for fossil plant O&M.

**U.S. District Court for the District of Montana (Billings Generation, Inc. vs. Electrical Controls, Inc, et al., CV-04-123-BLG-RFC) – August 2006**

Quantification of plaintiff's business losses during an extended power plant outage and plaintiff's business earnings due to the shortening and delay of future plant outages.  
[Confidential Expert Report]

**Deposition in South Dakota Public Utility Commission Case No. EL05-022 – June 14, 2006**

**South Dakota Public Utility Commission (Case No. EL05-022) – May and June 2006**

Whether the co-owners of the proposed Big Stone II coal-fired generating plant have appropriately reflected the potential for the regulation of greenhouse gases in their analyses of the alternatives to the proposed facility; the need and timing for new supply options in the co-owners' service territories; and whether there are alternatives to the proposed facility that are technically feasible and economically cost-effective.

**Georgia Public Service Commission (Docket No. 22449-U) – May 2006**

Georgia Power Company's request for an accounting order to record early site permitting and construction operating license costs for new nuclear power plants.



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**California Public Utilities Commission (Dockets Nos. A.05-11-008 and A.05-11-009) – April 2006**

The estimated costs for decommissioning the Diablo Canyon, SONGS 2&3 and Palo Verde nuclear power plants and the annual contributions that are needed from ratepayers to assure that adequate funds will be available to decommission these plants at the projected ends of their service lives.

**New Jersey Board of Public Utilities (Docket No. EM05020106) – November and December 2005 and March 2006**

Joint Testimony with Bob Fagan and Bruce Biewald on the market power implications of the proposed merger between Exelon Corp. and Public Service Enterprise Group.

**Virginia State Corporation Commission (Case No. PUE-2005-00018)– November 2005**

The siting of a proposed 230 kV transmission line.

**Iowa Utility Board (Docket No. SPU-05-15) – September and October 2005**

The reasonableness of IPL's proposed sale of the Duane Arnold Energy Center nuclear plant.

**New York State Department of Environmental Conservation (DEC #3-3346-00011/00002) – October 2005**

The likely profits that Dynegy will earn from the sale of the energy and capacity of the Danskammer Generating Facility if the plant is converted from once-through to closed-cycle cooling with wet towers or to dry cooling.

**Arkansas Public Service Commission (Docket 05-042-U) – July and August 2005**

Arkansas Electric Cooperative Corporation's proposed purchase of the Wrightsville Power Facility.

**Maine Public Utilities Commission (Docket No. 2005-17) – July 2005**

Joint testimony with Peter Lanzalotta and Bob Fagan evaluating Eastern Maine Electric Cooperative's request for a CPCN to purchase 15 MW of transmission capacity from New Brunswick Power.

**Federal Energy Regulatory Commission (Docket No. EC05-43-0000) – April and May 2005**

Joint Affidavit and Supplemental Affidavit with Bruce Biewald on the market power aspects of the proposed merger of Exelon Corporation and Public Service Enterprise Group, Inc.

**Maine Public Utilities Commission (Docket No. 2004-538 Phase II) – April 2005**

Joint testimony with Peter Lanzalotta and Bob Fagan evaluating Maine Public Service Company's request for a CPCN to purchase 35 MW of transmission capacity from New Brunswick Power.

**Maine Public Utilities Commission (Docket No. 2004-771) – March 2005**

Analysis of Bangor Hydro-Electric's Petition for a Certificate of Public Convenience and Necessity to construct a 345 kV transmission line

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**United States District Court for the Southern District of Ohio, Eastern Division  
(Consolidated Civil Actions Nos. C2-99-1182 and C2-99-1250)**

Whether the public release of company documents more than three years old would cause competitive harm to the American Electric Power Company. [Confidential Expert Report]

**New Jersey Board of Public Utilities (Docket No. EO03121014) – February 2005**

Whether the Board of Public Utilities can halt further collections from Jersey Central Power & Light Company's ratepayers because there already are adequate funds in the company's decommissioning trusts for the Three Mile Island Unit No. 2 Nuclear Plant to allow for the decommissioning of that unit without endangered the public health and safety.

**Maine Public Utilities Commission (Docket No. 2004-538) – January and March 2005**

Analysis of Maine Public Service Company's request to construct a 138 kV transmission line from Limestone, Maine to the Canadian Border.

**California Public Utilities Commission (Application No. AO4-02-026) – December 2004 and January 2005**

Southern California Edison's proposed replacement of the steam generators at the San Onofre Unit 2 and Unit 3 nuclear power plants and whether the utility was imprudent for failing to initiate litigation against Combustion Engineering due to defects in the design of and materials used in those steam generators.

**United States District Court for the Southern District of Indiana, Indianapolis Division  
(Civil Action No. IP99-1693) – December 2004**

Whether the public release of company documents more than three years old would cause competitive harm to the Cinergy Corporation. [Confidential Expert Report]

**California Public Utilities Commission (Application No. AO4-01-009) – August 2004**

Pacific Gas & Electric's proposed replacement of the steam generators at the Diablo Canyon nuclear power plant and whether the utility was imprudent for failing to initiate litigation against Westinghouse due to defects in the design of and materials used in those steam generators.

**Public Service Commission of Wisconsin (Docket No. 6690-CE-187) – June, July and August 2004**

Whether Wisconsin Public Service Corporation's request for approval to build a proposed 515 MW coal-burning generating facility should be granted.

**Public Service Commission of Wisconsin (Docket No. 05-EI-136) – May and June 2004**

Whether the proposed sale of the Kewaunee Nuclear Power Plant to a subsidiary of an out-of-state holding company is in the public interest.

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**Connecticut Siting Council (Docket No. 272) – May 2004**

Whether there are technically viable alternatives to the proposed 345-kV transmission line between Middletown and Norwalk Connecticut and the length of the line that can be installed underground.

**Arizona Corporation Commission (Docket No. E-01345A-03-0437 – February 2004**

Whether Arizona Public Service Company should be allowed to acquire and include in rate base five generating units that were built by a deregulated affiliate.

**State of Rhode Island Energy Facilities Siting Board (Docket No. SB-2003-1) – February 2004**

Whether the cost of undergrounding a relocated 115kV transmission line would be eligible for regional cost socialization.

**State of Maine Department of Environmental Protection (Docket No. A-82-75-0-X) – December 2003**

The storage of irradiated nuclear fuel in an Independent Spent Fuel Storage Installation (ISFSI) and whether such an installation represents an air pollution control facility.

**Rhode Island Public Utility Commission (Docket No. 3564) – December 2003 and January 2004**

Whether Narragansett Electric Company should be required to install a relocated 115kV transmission line underground.

**New York State Board on Electric Generation Siting and the Environment (Case No. 01-F-1276) – September, October and November 2003**

The environmental, economic and system reliability benefits that can reasonably be expected from the proposed 1,100 MW TransGas Energy generating facility in Brooklyn, New York.

**Wisconsin Public Service Commission (Case 6690-UR-115209) - September and October 2003**

The reasonableness of Wisconsin Public Service Corporation's decommissioning cost collections for the Kewaunee Nuclear Plant.

**Oklahoma Corporation Commission (Cause No. 2003-121) – July 2003**

Whether Empire District Electric Company properly reduced its capital costs to reflect the write-off of a portion of the cost of building a new electric generating facility.

**Arkansas Public Service Commission (Docket 02-248-U) – May 2003**

Entergy's proposed replacement of the steam generators and the reactor vessel head at the ANO Unit 1 Steam Generating Station.

**Appellate Tax Board, State of Massachusetts (Docket No C258405-406) – May 2003**

The physical nature of electricity and whether electricity is a tangible product or a service.

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**Maine Public Utilities Commission (Docket 2002-665-U) – April 2003**

Analysis of Central Maine Power Company's proposed transmission line for Southern York County and recommendation of alternatives.

**Massachusetts Legislature, Joint Committees on Government Regulations and Energy – March 2003**

Whether PG&E can decide to permanently retire one or more of the generating units at its Salem Harbor Station if it is not granted an extension beyond October 2004 to reduce the emissions from the Station's three coal-fired units and one oil-fired unit.

**New Jersey Board of Public Utilities (Docket No. ER02080614) – January 2003**

The prudence of Rockland Electric Company's power purchases during the period August 1, 1999 through July 31, 2002.

**New York State Board on Electric Generation Siting and the Environment (Case No. 00-F-1356) – September and October 2002 and January 2003**

The need for and the environmental benefits from the proposed 300 MW Kings Park Energy generating facility.

**Arizona Corporation Commission (Docket No. E-01345A-01-0822) – March 2002**

The reasonableness of Arizona Public Service Company's proposed long-term power purchase agreement with an affiliated company.

**New York State Board on Electric Generation Siting and the Environment (Case No. 99-F-1627) – March 2002**

Repowering NYPA's existing Poletti Station in Queens, New York.

**Connecticut Siting Council (Docket No. 217) – March 2002, November 2002, and January 2003**

Whether the proposed 345-kV transmission line between Plumtree and Norwalk substations in Southwestern Connecticut is needed and will produce public benefits.

**Vermont Public Service Board (Case No. 6545) – January 2002**

Whether the proposed sale of the Vermont Yankee Nuclear Plant to Entergy is in the public interest of the State of Vermont and Vermont ratepayers.

**Connecticut Department of Public Utility Control (Docket 99-09-12RE02) – December 2001**

The reasonableness of adjustments that Connecticut Light and Power Company seeks to make to the proceeds that it received from the sale of Millstone Nuclear Power Station.

**Connecticut Siting Council (Docket No. 208) – October 2001**

Whether the proposed cross-sound cable between Connecticut and Long Island is needed and will produce public benefits for Connecticut consumers.

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**New Jersey Board of Public Utilities (Docket No. EM01050308) - September 2001**

The market power implications of the proposed merger between Conectiv and Pepco.

**Illinois Commerce Commission Docket No. 01-0423 – August, September, and October 2001**

Commonwealth Edison Company's management of its distribution and transmission systems.

**New York State Board on Electric Generation Siting and the Environment (Case No. 99-F-1627) - August and September 2001**

The environmental benefits from the proposed 500 MW NYPA Astoria generating facility.

**New York State Board on Electric Generation Siting and the Environment (Case No. 99-F-1191) - June 2001**

The environmental benefits from the proposed 1,000 MW Astoria Energy generating facility.

**New Jersey Board of Public Utilities (Docket No. EM00110870) - May 2001**

The market power implications of the proposed merger between FirstEnergy and GPU Energy.

**Connecticut Department of Public Utility Control (Docket 99-09-12RE01) - November 2000**

The proposed sale of Millstone Nuclear Station to Dominion Nuclear, Inc.

**Illinois Commerce Commission (Docket 00-0361) - August 2000**

The impact of nuclear power plant life extensions on Commonwealth Edison Company's decommissioning costs and collections from ratepayers.

**Vermont Public Service Board (Docket 6300) - April 2000**

Whether the proposed sale of the Vermont Yankee nuclear plant to AmerGen Vermont is in the public interest.

**Massachusetts Department of Telecommunications and Energy (Docket 99-107, Phase II) - April and June 2000**

The causes of the May 18, 1999, main transformer fire at the Pilgrim generating station.

**Connecticut Department of Public Utility Control (Docket 00-01-11) - March and April 2000**

The impact of the proposed merger between Northeast Utilities and Con Edison, Inc. on the reliability of the electric service being provided to Connecticut ratepayers.

**Connecticut Department of Public Utility Control (Docket 99-09-12) - January 2000**

The reasonableness of Northeast Utilities plan for auctioning the Millstone Nuclear Station.

**Connecticut Department of Public Utility Control (Docket 99-08-01) - November 1999**

Generation, Transmission, and Distribution system reliability.

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**Illinois Commerce Commission (Docket 99-0115) - September 1999**

Commonwealth Edison Company's decommissioning cost estimate for the Zion Nuclear Station.

**Connecticut Department of Public Utility Control (Docket 99-03-36) - July 1999**

Standard offer rates for Connecticut Light & Power Company.

**Connecticut Department of Public Utility Control (Docket 99-03-35) - July 1999**

Standard offer rates for United Illuminating Company.

**Connecticut Department of Public Utility Control (Docket 99-02-05) - April 1999**

Connecticut Light & Power Company stranded costs.

**Connecticut Department of Public Utility Control (Docket 99-03-04) - April 1999**

United Illuminating Company stranded costs.

**Maryland Public Service Commission (Docket 8795) - December 1998**

Future operating performance of Delmarva Power Company's nuclear units.

**Maryland Public Service Commission (Dockets 8794/8804) - December 1998**

Baltimore Gas and Electric Company's proposed replacement of the steam generators at the Calvert Cliffs Nuclear Power Plant. Future performance of nuclear units.

**Indiana Utility Regulatory Commission (Docket 38702-FAC-40-S1) - November 1998**

Whether the ongoing outages of the two units at the D.C. Cook Nuclear Plant were caused or extended by mismanagement.

**Arkansas Public Service Commission (Docket 98-065-U) - October 1998**

Entergy's proposed replacement of the steam generators at the ANO Unit 2 Steam Generating Station.

**Massachusetts Department of Telecommunications and Energy (Docket 97-120) - October 1998**

Western Massachusetts Electric Company's Transition Charge. Whether the extended 1996-1998 outages of the three units at the Millstone Nuclear Station were caused or extended by mismanagement.

**Connecticut Department of Public Utility Control (Docket 98-01-02) - September 1998**

Nuclear plant operations, operating and capital costs, and system reliability improvement costs.

**Illinois Commerce Commission (Docket 97-0015) - May 1998**

Whether any of the outages of Commonwealth Edison Company's twelve nuclear units during 1996 were caused or extended by mismanagement. Whether equipment problems, personnel performance weaknesses, and program deficiencies could have been avoided or addressed prior to plant outages. Outage-related fuel and replacement power costs.

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**Public Service Commission of West Virginia (Case 97-1329-E-CN) - March 1998**

The need for a proposed 765 kV transmission line from Wyoming, West Virginia, to Cloverdate, Virginia.

**Illinois Commerce Commission (Docket 97-0018) - March 1998**

Whether any of the outages of the Clinton Power Station during 1996 were caused or extended by mismanagement.

**Connecticut Department of Public Utility Control (Docket 97-05-12) - October 1997**

The increased costs resulting from the ongoing outages of the three units at the Millstone Nuclear Station.

**New Jersey Board of Public Utilities (Docket ER96030257) - August 1996**

Replacement power costs during plant outages.

**Illinois Commerce Commission (Docket 95-0119) - February 1996**

Whether any of the outages of Commonwealth Edison Company's twelve nuclear units during 1994 were caused or extended by mismanagement. Whether equipment problems, personnel performance weaknesses, and program deficiencies could have been avoided or addressed prior to plant outages. Outage-related fuel and replacement power costs.

**Public Utility Commission of Texas (Docket 13170) - December 1994**

Whether any of the outages of the River Bend Nuclear Station during the period October 1, 1991, through December 31, 1993, were caused or extended by mismanagement.

**Public Utility Commission of Texas (Docket 12820) - October 1994**

Operations and maintenance expenses during outages of the South Texas Nuclear Generating Station.

**Wisconsin Public Service Commission (Cases 6630-CE-197 and 6630-CE-209) - September and October 1994**

The reasonableness of the projected cost and schedule for the replacement of the steam generators at the Point Beach Nuclear Power Plant. The potential impact of plant aging on future operating costs and performance.

**Public Utility Commission of Texas (Docket 12700) - June 1994**

Whether El Paso Electric Company's share of Palo Verde Unit 3 was needed to ensure adequate levels of system reliability. Whether the Company's investment in Unit 3 could be expected to generate cost savings for ratepayers within a reasonable number of years.

**Arizona Corporation Commission (Docket U-1551-93-272) - May and June 1994**

Southwest Gas Corporation's plastic and steel pipe repair and replacement programs.

**Connecticut Department of Public Utility Control (Docket 92-04-15) - March 1994**

Northeast Utilities management of the 1992/1993 replacement of the steam generators at Millstone Unit 2.

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**Connecticut Department of Public Utility Control (Docket 92-10-03) - August 1993**

Whether the 1991 outage of Millstone Unit 3 as a result of the corrosion of safety-related plant piping systems was due to mismanagement.

**Public Utility Commission of Texas (Docket 11735) - April and July 1993**

Whether any of the outages of the Comanche Peak Unit 1 Nuclear Station during the period August 13, 1990, through June 30, 1992, were caused or extended by mismanagement.

**Connecticut Department of Public Utility Control (Docket 91-12-07) - January 1993 and August 1995**

Whether the November 6, 1991, pipe rupture at Millstone Unit 2 and the related outages of the Connecticut Yankee and Millstone units were caused or extended by mismanagement. The impact of environmental requirements on power plant design and operation.

**Connecticut Department of Public Utility Control (Docket 92-06-05) - September 1992**

United Illuminating Company off-system capacity sales. [Confidential Testimony]

**Public Utility Commission of Texas (Docket 10894) - August 1992**

Whether any of the outages of the River Bend Nuclear Station during the period October 1, 1988, through September 30, 1991, were caused or extended by mismanagement.

**Connecticut Department of Public Utility Control (Docket 92-01-05) - August 1992**

Whether the July 1991 outage of Millstone Unit 3 due to the fouling of important plant systems by blue mussels was the result of mismanagement.

**California Public Utilities Commission (Docket 90-12-018) - November 1991, April 1992, June and July 1993**

Whether any of the outages of the three units at the Palo Verde Nuclear Generating Station during 1989 and 1990 were caused or extended by mismanagement. Whether equipment problems, personnel performance weaknesses and program deficiencies could have been avoided or addressed prior to outages. Whether specific plant operating cost and capital expenditures were necessary and prudent.

**Public Utility Commission of Texas (Docket 9945) - June 1991**

Whether El Paso Electric Company's share of Palo Verde Unit 3 was needed to ensure adequate levels of system reliability. Whether the Company's investment in the unit could be expected to generate cost savings for ratepayers within a reasonable number of years. El Paso Electric Company's management of the planning and licensing of the Arizona Interconnection Project transmission line.

**Arizona Corporation Commission (Docket U-1345-90-007) - December 1990 and April 1991**

Arizona Public Service Company's management of the planning, construction and operation of the Palo Verde Nuclear Generating Station. The costs resulting from identified instances of mismanagement.



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**New Jersey Board of Public Utilities (Docket ER89110912J) - July and October 1990**

The economic costs and benefits of the early retirement of the Oyster Creek Nuclear Plant. The potential impact of the unit's early retirement on system reliability. The cost and schedule for siting and constructing a replacement natural gas-fired generating plant.

**Public Utility Commission of Texas (Docket 9300) - June and July 1990**

Texas Utilities management of the design and construction of the Comanche Peak Nuclear Plant. Whether the Company was prudent in repurchasing minority owners' shares of Comanche Peak without examining the costs and benefits of the repurchase for its ratepayers.

**Federal Energy Regulatory Commission (Docket EL-88-5-000) - November 1989**

Boston Edison's corporate management of the Pilgrim Nuclear Station.

**Connecticut Department of Public Utility Control (Docket 89-08-11) - November 1989**

United Illuminating Company's off-system capacity sales.

**Kansas State Corporation Commission (Case 164,211-U) - April 1989**

Whether any of the 127 days of outages of the Wolf Creek generating plant during 1987 and 1988 were the result of mismanagement.

**Public Utility Commission of Texas (Docket 8425) - March 1989**

Whether Houston Lighting & Power Company's new Limestone Unit 2 generating facility was needed to provide adequate levels of system reliability. Whether the Company's investment in Limestone Unit 2 would provide a net economic benefit for ratepayers.

**Illinois Commerce Commission (Dockets 83-0537 and 84-0555) - July 1985 and January 1989**

Commonwealth Edison Company's management of quality assurance and quality control activities and the actions of project contractors during construction of the Byron Nuclear Station.

**New Mexico Public Service Commission (Case 2146, Part II) - October 1988**

The rate consequences of Public Service Company of New Mexico's ownership of Palo Verde Units 1 and 2.

**United States District Court for the Eastern District of New York (Case 87-646-JBW) - October 1988**

Whether the Long Island Lighting Company withheld important information from the New York State Public Service Commission, the New York State Board on Electric Generating Siting and the Environment, and the U.S. Nuclear Regulatory Commission.

**Public Utility Commission of Texas (Docket 6668) - August 1988 and June 1989**

Houston Light & Power Company's management of the design and construction of the South Texas Nuclear Project. The impact of safety-related and environmental requirements on plant construction costs and schedule.

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**Federal Energy Regulatory Commission (Docket ER88-202-000) - June 1988**

Whether the turbine generator vibration problems that extended the 1987 outage of the Maine Yankee nuclear plant were caused by mismanagement.

**Illinois Commerce Commission (Docket 87-0695) - April 1988**

Illinois Power Company's planning for the Clinton Nuclear Station.

**North Carolina Utilities Commission (Docket E-2, Sub 537) - February 1988**

Carolina Power & Light Company's management of the design and construction of the Harris Nuclear Project. The Company's management of quality assurance and quality control activities. The impact of safety-related and environmental requirements on construction costs and schedule. The cost and schedule consequences of identified instances of mismanagement.

**Ohio Public Utilities Commission (Case 87-689-EL-AIR) - October 1987**

Whether any of Ohio Edison's share of the Perry Unit 2 generating facility was needed to ensure adequate levels of system reliability. Whether the Company's investment in Perry Unit 1 would produce a net economic benefit for ratepayers.

**North Carolina Utilities Commission (Docket E-2, Sub 526) - May 1987**

Fuel factor calculations.

**New York State Public Service Commission (Case 29484) - May 1987**

The planned startup and power ascension testing program for the Nine Mile Point Unit 2 generating facility.

**Illinois Commerce Commission (Dockets 86-0043 and 86-0096) - April 1987**

The reasonableness of certain terms in a proposed Power Supply Agreement.

**Illinois Commerce Commission (Docket 86-0405) - March 1987**

The in-service criteria to be used to determine when a new generating facility was capable of providing safe, adequate, reliable and efficient service.

**Indiana Public Service Commission (Case 38045) - November 1986**

Northern Indiana Public Service Company's planning for the Schaefer Unit 18 generating facility. Whether the capacity from Unit 18 was needed to ensure adequate system reliability. The rate consequences of excess capacity on the Company's system.

**Superior Court in Rockingham County, New Hampshire (Case 86E328) - July 1986**

The radiation effects of low power testing on the structures, equipment and components in a new nuclear power plant.

**New York State Public Service Commission (Case 28124) - April 1986 and May 1987**

The terms and provisions in a utility's contract with an equipment supplier. The prudence of the utility's planning for a new generating facility. Expenditures on a canceled generating facility.

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**Arizona Corporation Commission (Docket U-1345-85) - February 1986**

The construction schedule for Palo Verde Unit No. 1. Regulatory and technical factors that would likely affect future plant operating costs.

**New York State Public Service Commission (Case 29124) – December 1985 and January 1986**

Niagara Mohawk Power Corporation's management of construction of the Nine Mile Point Unit No. 2 nuclear power plant.

**New York State Public Service Commission (Case 28252) - October 1985**

A performance standard for the Shoreham nuclear power plant.

**New York State Public Service Commission (Case 29069) - August 1985**

A performance standard for the Nine Mile Point Unit No. 2 nuclear power plant.

**Missouri Public Service Commission (Cases ER-85-128 and EO-85-185) - July 1985**

The impact of safety-related regulatory requirements and plant aging on power plant operating costs and performance. Regulatory factors and plant-specific design features that will likely affect the future operating costs and performance of the Wolf Creek Nuclear Plant.

**Massachusetts Department of Public Utilities (Case 84-152) - January 1985**

The impact of safety-related regulatory requirements and plant aging on power plant operating costs and performance. Regulatory factors and plant-specific design features that will likely affect the future operating costs and performance of the Seabrook Nuclear Plant.

**Maine Public Utilities Commission (Docket 84-113) - September 1984**

The impact of safety-related regulatory requirements and plant aging on power plant operating costs and performance. Regulatory factors and plant-specific design features that will likely affect the future operating costs and performance of the Seabrook Nuclear Plant.

**South Carolina Public Service Commission (Case 84-122-E) - August 1984**

The repair and replacement strategy adopted by Carolina Power & Light Company in response to pipe cracking at the Brunswick Nuclear Station. Quantification of replacement power costs attributable to identified instances of mismanagement.

**Vermont Public Service Board (Case 4865) - May 1984**

The repair and replacement strategy adopted by management in response to pipe cracking at the Vermont Yankee nuclear plant.

**New York State Public Service Commission (Case 28347) - January 1984**

The information that was available to Niagara Mohawk Power Corporation prior to 1982 concerning the potential for cracking in safety-related piping systems at the Nine Mile Point Unit No. 1 nuclear plant.

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**New York State Public Service Commission (Case 28166) - February 1983 and February 1984**

Whether the January 25, 1982, steam generator tube rupture at the Ginna Nuclear Plant was caused by mismanagement.

**U.S. Nuclear Regulatory Commission (Case 50-247SP) - May 1983**

The economic costs and benefits of the early retirement of the Indian Point nuclear plants.

**REPORTS, ARTICLES, AND PRESENTATIONS**

*The Risks of Building New Nuclear Power Plants*, Presentation to the Utah State Legislature Public Utilities and Technology Committee, September 19, 2007.

*The Risks of Building New Nuclear Power Plants*, Presentation to Moody's and Standard & Poor's rating agencies, May 17, 2007.

*The Risks of Building New Nuclear Power Plants*, U.S. Senate and House of Representative Briefings, April 20, 2007.

*Carbon Dioxide Emissions Costs and Electricity Resource Planning*, New Mexico Public Regulation Commission, Case 06-00448-UT, March 28, 2007, with Anna Sommer.

*The Risks of Building New Nuclear Power Plants*, Presentation to the New York Society of Securities Analysts, June 8, 2006.

*Conservation and Renewable Energy Should be the Cornerstone for Meeting Future Natural Gas Needs*. Presentation to the Global LNG Summit, June 1, 2004. Presentation given by Cliff Chen.

*Comments on natural gas utilities' Phase I Proposals for pre-approved full cost recovery of contracts with liquid natural gas (LNG) suppliers and the costs of interconnecting their systems with LNG facilities*. Comments in California Public Utilities Commission Rulemaking 04-01-025. March 23, 2004.

*The 2003 Blackout: Solutions that Won't Cost a Fortune*, The Electricity Journal, November 2003, with David White, Amy Roschelle, Paul Peterson, Bruce Biewald, and William Steinhurst.

*The Impact of Converting the Cooling Systems at Indian Point Units 2 and 3 on Electric System Reliability*. An Analysis for Riverkeeper, Inc. November 3, 2003.

*The Impact of Converting Indian Point Units 2 and 3 to Closed-Cycle Cooling Systems with Cooling Towers on Energy's Likely Future Earnings*. An Analysis for Riverkeeper, Inc. November 3, 2003.

*Entergy's Lost Revenues During Outages of Indian Point Units 2 and 3 to Convert to Closed-Cycle Cooling Systems*. An Analysis for Riverkeeper, Inc. November 3, 2003.

*Power Plant Repowering as a Strategy for Reducing Water Consumption at Existing Electric Generating Facilities*. A presentation at the May 2003 Symposium on Cooling Water Intake Technologies to Protect Aquatic Organisms. May 6, 2003.

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*Financial Insecurity: The Increasing Use of Limited Liability Companies and Multi-tiered Holding Companies to Own Electric Generating Plants.* A presentation at the 2002 NASUCA Annual Meeting. November 12, 2002.

*Determining the Need for Proposed Overhead Transmission Facilities.* A Presentation by David Schlissel and Paul Peterson to the Task Force and Working Group for Connecticut Public Act 02-95. October 17, 2002.

*Future PG&E Net Revenues From The Sale of Electricity Generated at its Brayton Point Station.* An Analysis for the Attorney General of the State of Rhode Island. October 2, 2002.

*PG&E's Net Revenues From The Sale of Electricity Generated at its Brayton Point Station During the Years 1999-2002.* An Analysis for the Attorney General of the State of Rhode Island. October 2, 2002.

*Financial Insecurity: The Increasing Use of Limited Liability Companies and Multi-Tiered Holding Companies to Own Nuclear Power Plants.* A Synapse report for the STAR Foundation and Riverkeeper, Inc., by David Schlissel, Paul Peterson, and Bruce Biewald, August 7, 2002.

*Comments on EPA's Proposed Clean Water Act Section 316(b) for Cooling Water Intake Structures at Phase II Existing Facilities,* on behalf of Riverkeeper, Inc., by David Schlissel and Geoffrey Keith, August 2002.

*The Impact of Retiring the Indian Point Nuclear Power Station on Electric System Reliability.* A Synapse Report for Riverkeeper, Inc. and Pace Law School Energy Project. May 7, 2002.

*Preliminary Assessment of the Need for the Proposed Plumtree-Norwalk 345-kV Transmission Line.* A Synapse Report for the Towns of Bethel, Redding, Weston, and Wilton Connecticut. October 15, 2001.

*ISO New England's Generating Unit Availability Study: Where's the Beef?* A Presentation at the June 29, 2001 Restructuring Roundtable.

*Clean Air and Reliable Power: Connecticut Legislative House Bill HB6365 will not Jeopardize Electric System Reliability.* A Synapse Report for the Clean Air Task Force. May 2001.

*Room to Breathe: Why the Massachusetts Department of Environmental Protection's Proposed Air Regulations are Compatible with Reliability.* A Synapse Report for MASSPIRG and the Clean Water Fund. March 2001.

*Generator Outage Increases: A Preliminary Analysis of Outage Trends in the New England Electricity Market,* a Synapse Report for the Union of Concerned Scientists, January 7, 2001.

*Cost, Grid Reliability Concerns on the Rise Amid Restructuring,* with Charlie Harak, Boston Business Journal, August 18-24, 2000.

*Report on Indian Point 2 Steam Generator Issues,* Schlissel Technical Consulting, Inc., March 10, 2000.

*Preliminary Expert Report in Case 96-016613, Cities of Wharton, Pasadena, et al v. Houston Lighting & Power Company,* October 28, 1999.

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*Comments of Schlissel Technical Consulting, Inc. on the Nuclear Regulatory Commission's Draft Policy Statement on Electric Industry Economic Deregulation, February 1997.*

*Report to the Municipal Electric Utility Association of New York State on the Cost of Decommissioning the Fitzpatrick Nuclear Plant, August 1996.*

*Report to the Staff of the Arizona Corporation Commission on U.S. West Corporation's telephone cable repair and replacement programs, May, 1996.*

*Nuclear Power in the Competitive Environment, NRRI Quarterly Bulletin, Vol. 16, No. 3, Fall 1995.*

*Nuclear Power in the Competitive Environment, presentation at the 18th National Conference of Regulatory Attorneys, Scottsdale, Arizona, May 17, 1995.*

*The Potential Safety Consequences of Steam Generator Tube Cracking at the Byron and Braidwood Nuclear Stations, a report for the Environmental Law and Policy Center of the Midwest, 1995.*

*Report to the Public Policy Group Concerning Future Trojan Nuclear Plant Operating Performance and Costs, July 15, 1992.*

*Report to the New York State Consumer Protection Board on the Costs of the 1991 Refueling Outage of Indian Point 2, December 1991.*

*Preliminary Report on Excess Capacity Issues to the Public Utility Regulation Board of the City of El Paso, Texas, April 1991.*

*Nuclear Power Plant Construction Costs, presentation at the November, 1987, Conference of the National Association of State Utility Consumer Advocates.*

*Comments on the Final Report of the National Electric Reliability Study, a report for the New York State Consumer Protection Board, February 27, 1981.*

## **OTHER SIGNIFICANT INVESTIGATIONS AND LITIGATION SUPPORT WORK**

Reviewed the salt deposition mitigation strategy proposed for Reliant Energy's repowering of its Astoria Generating Station. October 2002 through February 2003.

Assisted the Connecticut Office of Consumer Counsel in reviewing the auction of Connecticut Light & Power Company's power purchase agreements. August and September, 2000.

Assisted the New Jersey Division of the Ratepayer Advocate in evaluating the reasonableness of Atlantic City Electric Company's proposed sale of its fossil generating facilities. June and July, 2000.

Investigated whether the 1996-1998 outages of the three Millstone Nuclear Units were caused or extended by mismanagement. 1997 and 1998. Clients were the Connecticut Office of Consumer Counsel and the Office of the Attorney General of the Commonwealth of Massachusetts.

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Investigated whether the 1995-1997 outages of the two units at the Salem Nuclear Station were caused or extended by mismanagement. 1996-1997. Client was the New Jersey Division of the Ratepayer Advocate.

Assisted the Associated Industries of Massachusetts in quantifying the stranded costs associated with utility generating plants in the New England states. May through July, 1996

Investigated whether the December 25, 1993, turbine generator failure and fire at the Fermi 2 generating plant was caused by Detroit Edison Company's mismanagement of fabrication, operation or maintenance. 1995. Client was the Attorney General of the State of Michigan.

Investigated whether the outages of the two units at the South Texas Nuclear Generating Station during the years 1990 through 1994 were caused or extended by mismanagement. Client was the Texas Office of Public Utility Counsel.

Assisted the City Public Service Board of San Antonio, Texas in litigation over Houston Lighting & Power Company's management of operations of the South Texas Nuclear Generating Station.

Investigated whether outages of the Millstone nuclear units during the years 1991 through 1994 were caused or extended by mismanagement. Client was the Office of the Attorney General of the Commonwealth of Massachusetts.

Evaluated the 1994 Decommissioning Cost Estimate for the Maine Yankee Nuclear Plant. Client was the Public Advocate of the State of Maine.

Evaluated the 1994 Decommissioning Cost Estimate for the Seabrook Nuclear Plant. Clients were investment firms that were evaluating whether to purchase the Great Bay Power Company, one of Seabrook's minority owners.

Investigated whether a proposed natural-gas fired generating facility was need to ensure adequate levels of system reliability. Examined the potential impacts of environmental regulations on the unit's expected construction cost and schedule. 1992. Client was the New Jersey Rate Counsel.

Investigated whether Public Service Company of New Mexico management had adequately disclosed to potential investors the risk that it would be unable to market its excess generating capacity. Clients were individual shareholders of Public Service Company of New Mexico.

Investigated whether the Seabrook Nuclear Plant was prudently designed and constructed. 1989. Clients were the Connecticut Office of Consumer Counsel and the Attorney General of the State of Connecticut.

Investigated whether Carolina Power & Light Company had prudently managed the design and construction of the Harris nuclear plant. 1988-1989. Clients were the North Carolina Electric Municipal Power Agency and the City of Fayetteville, North Carolina.

Investigated whether the Grand Gulf nuclear plant had been prudently designed and constructed. 1988. Client was the Arkansas Public Service Commission.

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Reviewed the financial incentive program proposed by the New York State Public Service Commission to improve nuclear power plant safety. 1987. Client was the New York State Consumer Protection Board.

Reviewed the construction cost and schedule of the Hope Creek Nuclear Generating Station. 1986-1987. Client was the New Jersey Rate Counsel.

Reviewed the operating performance of the Fort St. Vrain Nuclear Plant. 1985. Client was the Colorado Office of Consumer Counsel.

## **WORK HISTORY**

2000 - Present: Senior Consultant, Synapse Energy Economics, Inc.

1994 - 2000: President, Schlissel Technical Consulting, Inc.

1983 - 1994: Director, Schlissel Engineering Associates

1979 - 1983: Private Legal and Consulting Practice

1975 - 1979: Attorney, New York State Consumer Protection Board

1973 - 1975: Staff Attorney, Georgia Power Project

## **EDUCATION**

1983-1985: Massachusetts Institute of Technology  
Special Graduate Student in Nuclear Engineering and Project Management,

1973: Stanford Law School,  
Juris Doctor

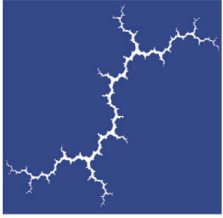
1969: Stanford University  
Master of Science in Astronautical Engineering,

1968: Massachusetts Institute of Technology  
Bachelor of Science in Astronautical Engineering,

## **PROFESSIONAL MEMBERSHIPS**

- New York State Bar since 1981
- American Nuclear Society
- National Association of Corrosion Engineers





**Synapse**  
Energy Economics, Inc.

## **Report on the Availability of Replacement Capacity and Energy for Indian Point Units 2 & 3**

**November 28, 2007**

**AUTHOR**

**David Schlissel**



22 Pearl Street  
Cambridge, MA 02139

[www.synapse-energy.com](http://www.synapse-energy.com)  
617.661.3248

Entergy Nuclear Operations has applied to the Nuclear Regulatory Commission for a renewal the two operating licenses for Indian Point Unit 2 and Unit 3 for an additional 20 years. This report examines the availability of: (1) renewable energy resources, (2) energy conservation and efficiency measures, (3) repowering of existing power plants, (4) transmission system upgrades and enhancements and (5) new power plants. The report concludes that the capacity and energy provided by Indian Point Units 2 and 3 can be replaced if the Units are not relicensed. In particular, energy efficiency, renewable resources, the repowering of older generating facilities, transmission upgrades and new natural gas-fired generating facilities represent viable alternatives to the relicensing of Indian Point. Substantial reductions in peak demand and energy requirements will be achieved by 2013 under the state's newly announced "15 by 15" Clean Energy Plan. Significant amounts of new renewable resources will be available as a result of the state's renewable energy portfolio standard and other initiatives. In addition, thousands of megawatts ("MW") of new generating capacity can be provided by the repowering (i.e., rebuilding) of older generating facilities both along the Hudson River and in the downstate area of the state in New York City and on Long Island. At the same time, transmission system upgrades also can increase the amounts of power that can be provided to the downstate region of the State. Finally, there is the potential for the addition of several thousand megawatts of new generating facilities in the Hudson River Valley and in downstate New York.

This report was prepared by David A. Schlissel. Mr. Schlissel is a Senior Consultant at Synapse Energy Economics. Since 1973, he has served as a consultant, expert witness, and attorney on complex management, engineering, and economic issues, primarily in the fields of energy and the environment. Prior to joining Synapse, Mr. Schlissel was the president of Schlissel Technical Consulting, Inc. and its predecessor, Schlissel Engineering Associates.

Mr. Schlissel has been retained by regulatory commissions, consumer advocates, publicly-owned utilities, non-utility generators, governmental agencies, and private organizations in 23 states to prepare expert analyses on issues related to electric, natural gas, and telephone utilities. He has presented testimony in more than 100 cases before regulatory boards and commissions in 28 states, two federal regulatory agencies, and in state and federal court proceedings.

Recent work has involved the evaluation of electric transmission and distribution system reliability, power plant operations and outages, industry restructuring including quantification of stranded costs, proposed nuclear and fossil power plant sales, and proposed utility mergers. Mr. Schlissel has also examined the impact of nuclear power plant life extension on plant decommissioning costs.

Mr. Schlissel holds BS and MS degrees in Astronautical Engineering from the Massachusetts Institute of Technology (MIT) and Stanford University. He also received a Juris Doctor degree from Stanford University School of Law. He has also studied Nuclear Engineering and Project Management at MIT. He is a member

of the New York State Bar, the National Association of Corrosion Engineers, and the American Nuclear Society.

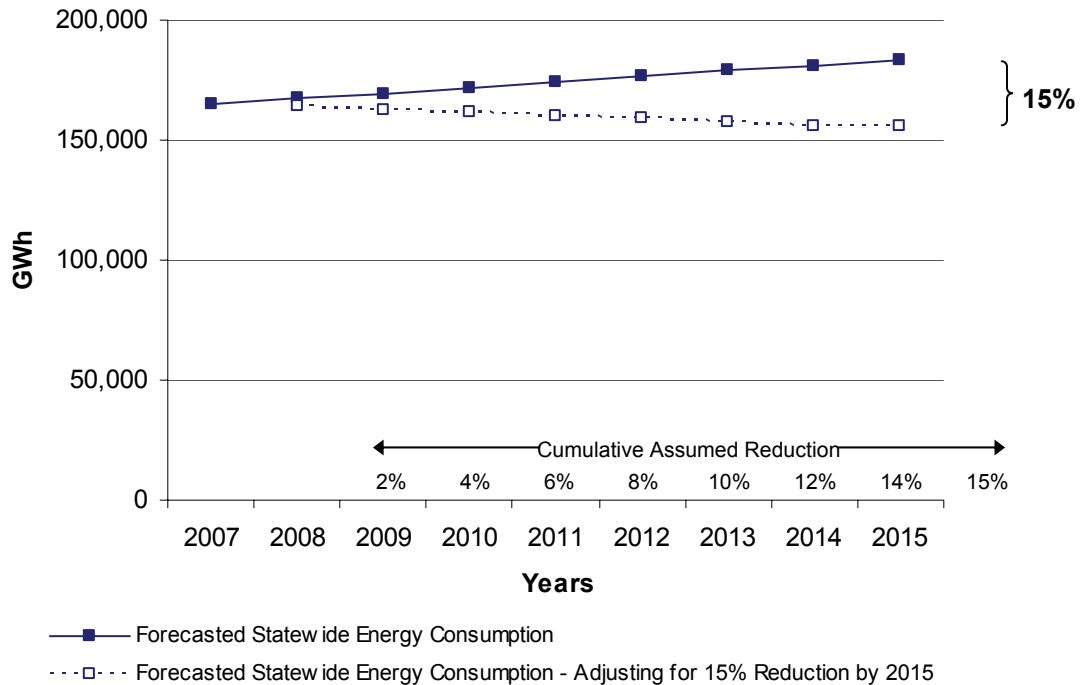
**ENERGY EFFICIENCY**

New York Governor Eliot Spitzer has announced a “15 by 15” Clean Energy Plan to reduce energy consumption in 2015 by 15 percent to be achieved by energy efficiency alone.<sup>1</sup> The energy efficiency that would be achieved under this Plan would more than replace the capacity and energy provided by both Indian Point Units.

As explained by the Governor, the plan would include taking actions to provide incentives to utilities to conserve energy, strengthening efficiency standards for energy intensive appliances and buildings, and by making the State Government’s use of energy more efficient.

The “15 by 15” plan would reduce statewide electricity consumption by approximately 27,000 GWh by 2015. Figure 1 below illustrates the energy savings that would be achieved under the program assuming a linear implementation.

**Figure 1 – Impact of New York State’s “15 by 15” Policy**



The reasonably expected annual generation from both Indian Point Units after 2013 would be approximately 15,600 GWh. This reflects a capacity rating of 979MW for

<sup>1</sup> Remarks by Governor Eliot Spitzer. “15 by 15”: A Clean Energy Strategy for New York. 19 Apr 2007. Found at: [http://www.state.ny.us/governor/keydocs/0419071\\_speech.html](http://www.state.ny.us/governor/keydocs/0419071_speech.html)

Indian Point Unit 2, a 1,000 MW capacity rating for Indian Point Unit 3, and 90 percent average annual capacity factors for both units. The capacity ratings for each unit reflect approximately 4 percent reductions in net plant output due to the potential addition of cooling towers.

To determine the potential of this policy to offset the Indian Point units, we evaluated the potential energy and summer peak capacity savings that can be expected from the “15 by 15” policy using both statewide<sup>2</sup> and zonal<sup>3</sup> forecasts of energy consumption in GWh by the New York Independent System Operator (NY ISO). We used zonal forecasts from Zones H, I, J and K to represent the region that the Indian Point units directly serve. However, it is also relevant to look at the potential for summer peak capacity savings statewide as the region does import power from other regions.

The ramp-in required to achieve the target of 15% energy reduction by 2015 had not been determined. Therefore, we assumed a linear ramp-in of 2% per year starting in 2008 and ending in 2014, with 1% remaining required in 2015 to reach the goal of 15%. We calculated the statewide and regional energy reductions that would be required to achieve this goal by multiplying the total forecasted energy consumption by state and region by the cumulative percentage reduction required for the given year.

We assumed that only 15% reductions would be achieved in the regions of New York State directly served by Indian Points (i.e., Zones H, I, J and K). This is a conservative assumption because it is likely that urban areas such as New York City and Long Island would be able to achieve greater energy reductions than more rural areas which would have fewer energy savings opportunities.

We then converted the energy reductions to summer peak capacity savings in order to assess the ability for these reduction goals to offset the need for the two Indian Point units after 2013. We calculated a ratio between summer peak capacity and energy based on achievable potential estimates from the most recent study of energy efficiency potential in New York State. This study was conducted for NYSERDA in 2003 by Optimal Energy Inc.<sup>4</sup>

### Statewide

We used the following methodology to develop ratios to be applied to estimated statewide energy reductions. As zones in the state have a range of avoided costs, I calculated a range of summer peak capacity savings using low and high avoided cost scenarios.

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<sup>2</sup> New York Independent System Operator (NY ISO). 2007 Load and Capacity Data. Table I-1. NYISO 2007 Long Term Forecast - 2007 to 2017: Energy (GWh). Pg. 4.

<sup>3</sup> New York Independent System Operator (NY ISO). 2007 Load and Capacity Data. Table I-2a. Forecast of Annual Energy by Zone – GWh. Pg. 5.

<sup>4</sup> Optimal Energy, Inc. Energy Efficiency and Renewable Energy Resource Development Potential in New York State. Final Report. Volume One: Summary Report. August 2003. Found at: <http://www.nyserda.org/sep/EE&ERpotentialVolume1.pdf>

Low Avoided Cost Scenario: A ratio between the statewide economic potential summer peak capacity savings and energy reductions in 2007 using low avoided costs (0.196) was applied to energy reductions from 2007-2011. A ratio between the statewide economic potential summer peak capacity savings and energy reductions in 2012 using high avoided costs (0.216) was applied to energy reductions from 2012-2015.<sup>5</sup>

High Avoided Cost Scenario: A ratio between the statewide economic potential summer peak capacity savings and energy reductions in 2007 using high avoided costs (0.212) was applied to energy reductions from 2007-2011. A ratio between the statewide economic potential summer peak capacity savings and energy reductions in 2012 using high avoided costs (0.229) was applied to energy reductions from 2012-2015.<sup>6</sup>

The energy reductions were multiplied by these ratios to arrive at summer peak capacity savings. A summary of the statewide results are shown in Table 1 below.

**Table 1 – Statewide Summer Peak Capacity Savings Under “15 by 15”**

	Cumulative Energy Reduction (GWh)	Cumulative Summer Peak Capacity Savings – Range from Low to High Avoided Costs (MW)	Indian Point – Cumulative Capacity (MW)
2008	3,349	656 – 710	
2009	6,779	1,328 – 1,436	
2010	10,305	2,019 – 2,183	
2011	13,923	2,728 – 2,950	
2012	17,662	3,817 – 4,049	
<b>2013</b>	21,451	<b>4,636 – 4,918</b>	<b>979</b>
2014	25,358	5,480 – 5,813	
<b>2015</b>	27,532	<b>5,950 – 6,311</b>	
<b>2016</b>			<b>1,979</b>

It is clear from this analysis that a statewide 15% energy reduction by 2015 would more than offset the power that would be provided by the two Indian Point units if they were relicensed.

<sup>5</sup> Optimal Energy, Inc. Energy Efficiency and Renewable Energy Resource Development Potential in New York State. Final Report. Volume One: Summary Report. August 2003. Table 1.5 New York Statewide Economic Potential – Low Avoided Costs. Pg. 3-4. Found at: <http://www.nyserda.org/sep/EE&ERpotentialVolume1.pdf>

<sup>6</sup> Optimal Energy, Inc. Energy Efficiency and Renewable Energy Resource Development Potential in New York State. Final Report. Volume One: Summary Report. August 2003. Table 1.6 New York Statewide Economic Potential – High Avoided Costs. Pg. 3-4. Found at: <http://www.nyserda.org/sep/EE&ERpotentialVolume1.pdf>

The Need for Indian Point in Downstate New York (Zones H, I, J and K)

We used a similar methodology to develop ratios to be applied to estimated regional energy reductions (including Zones H, I, J and K). The only difference was that we used higher avoided costs rather than the range of avoided costs to represent these zones because these zones typically have the highest avoided costs in the state.

**Table 2 – Regional Summer Peak Capacity Savings Under “15 by 15”**

	Cumulative Energy Reduction (GWh)	Cumulative Summer Peak Capacity Savings – High Avoided Costs (MW)	Indian Point – Cumulative Capacity (MW)
2008	1,748	370	
2009	3,541	750	
2010	5,394	1,143	
2011	7,301	1,547	
2012	9,288	2,129	
<b>2013</b>	11,282	<b>2,586</b>	<b>979</b>
2014	13,340	3,058	
<b>2015</b>	14,487	<b>3,321</b>	
<b>2016</b>			<b>1,979</b>

Again, a 15% energy reduction in 2015 statewide would more than offset both the energy and capacity from both Indian Point units and would eliminate any need to extend the license of the two units in 2013 and 2016.

Significantly, the 15 percent reduction in statewide energy consumption anticipated under the “15 by 15” plan would not represent all of the economical potential energy efficiency that has been identified in New York State. A recent presentation by Philip Mosenthal of Optimal Energy, Inc., has projected that there is 61,506 GWh of economically potential energy efficiency in the State.<sup>7</sup>

<sup>7</sup>

*Electric & Natural Gas Efficiency Potential in New York*, presentation by Philip Mosenthal, Optimal Energy, Inc., at the New York State Public Service Commission Energy Efficiency Portfolio Standard Overview Forum, July 19, 2007, slide no. 9.

## **RENEWABLE ENERGY RESOURCES**

According to NYSERDA's August 2007 *New York State Renewable Portfolio Standard Performance Report for the Program Period ending March 2007*, new renewable capacity installed since the onset of the Renewable Portfolio Standard (RPS) program could exceed 1,206 MW by the end of 2008, of which 1,184 MW would be located in New York State (p.2). The 1,206 MW of new installed capacity is expected to produce approximately 3.6 million MWh of electricity per year.<sup>8</sup>

This same Performance Report also noted that the September 24, 2004 New York PSC Order set forth annual energy targets representing how much renewable energy should be used by New York ratepayers to satisfy the 2013 goal of having 25% of the power consumed in New York come from renewable energy. The RPS energy targets set by the PSC in its September 24, 2004 Order are shown in Table 3 below.

**Table 3 - RPS Energy Targets Set by New York Public Service Commission**

	Main Tier Targets	Customer Sited Tier Targets	EO 111 Targets	Voluntary Market Targets	Combined Targets
2006	1,121,247	25,259	282,812	228,584	1,657,902
2007	2,326,171	50,488	314,579	457,167	3,148,405
2008	3,549,026	75,685	346,366	685,751	4,656,828
2009	4,767,994	100,855	378,174	914,335	6,161,358
2010	6,012,179	125,988	410,002	1,142,919	7,691,088
2011	7,297,746	151,081	391,857	1,371,502	9,212,186
2012	8,556,710	176,123	373,712	1,600,086	10,706,631
2013	9,854,038	201,130	355,568	1,828,670	12,239,406

Note: Not shown are energy targets associated with voluntary compliance by the Long Island Power Authority (LIPA) and the New York Power Authority (NYPA)

To meet these targets, New York will require the addition of the following MW of renewable resources:

**Table 4 - Estimated Renewable Energy Capacity for NY through 2013**

Type	Capacity (MW)
Co-fire biomass	296
Hydro	1,100
LFG	121
Off-shore wind	579
Wind	2,450
Solar	16
Small wind	1
Fuel cell	28
Grand Total	4,590

<sup>8</sup> At page 1.



There are an increasing number of analyses of the potential for renewable resources in New York State. It is reasonable to expect that the retirement of either or both Indian Point units at the end of their current NRC licenses would provide a substantial impetus to the development of additional renewable resources.

Wind Powering America: New York, a website sponsored by the US DOE, estimates that the in-state wind energy potential for New York State is 8,400 MW of capacity after land use and environmental exclusions. (available at <http://www.nrel.gov/docs/fy00osti/28090.pdf>).

NYISO's September 2007 *Comprehensive Reliability Plan 2007*, noted the following concerning wind capacity:

The NYISO interconnection queue includes proposals for wind generation that now total in excess of 5,000 MW. Wind generators are intermittent resources and have unique electrical characteristics that pose challenges for planning and operations of the interconnected system. The NYISO has completed a study conducted with GE Energy which evaluated the reliability and operating implications of the large scale integration of wind generation. The study concluded that if state-of-the-art wind technology is utilized, wind generation can reliably interconnect with only minor adjustments to existing planning, operating, and reliability practices.<sup>9</sup>

The study cited in this NYISO report is titled *The Effects of Integrating Wind Power on Transmission System Planning, Reliability, and Operations, Report on Phase 1, Preliminary Overall Reliability Assessment*, prepared for NYSERDA by GE Energy Consulting, 2004. A Phase 2 Report, *System Performance Evaluation*, also was completed in March 2005.

When combined with other energy resources, wind can produce energy in patterns comparable to a baseload generation facility. At the same time, the effects of short term wind variability can be mitigated by building a larger number of wind turbines and by siting the wind turbines in different geographic locations. There is no evidence that any replacement capacity for Indian Point would need to be a fully dispatchable facility. Indeed, the electric grid in New York State will already have a large number of fully dispatchable facilities.

Entergy merely rehashes the same tired old arguments against reliance on wind power. As a detailed 2004 Wind Integration Study – Final Report prepared for Xcel Energy and the Minnesota Department of Commerce has noted:

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<sup>9</sup> New York Independent System Operator, *The Comprehensive Reliability Plan 2007, A Long-Term Reliability Assessment of New York's Bulk Power System*, Final Report, September 2007, Appendices, at page 75.



Many of the earlier concerns and issues related to the possible impacts of large wind generation facilities on the transmission grid have been shown to be exaggerated or unfounded by a growing body of research studies and empirical understanding gained from the installation and operation of over 6000 MW of wind generation in the United States.<sup>10</sup>

Contrary to what Entergy has claimed, wind power can reduce the need for the capacity from Indian Point Units 2 and 3 and can provide low cost energy.

An August 2003 study prepared for NYSERDA, *Energy Efficiency and Renewable Energy Resource Development Potential in New York State*, by Optimal Energy, Inc., American Council for an Energy Efficient Economy, the Vermont Energy Investment Corporation and Christine T. Donovan Associates, has provided the following estimates of the potential for renewable resources and energy efficiency in New York State:

**Table 5 - New York Statewide Economic Potential – Low Avoided Costs**

	2007		2012		2022	
	Annual GWh	Summer Peak MW	Annual GWh	Summer Peak MW	Annual GWh	Summer Peak MW
<b>Energy Efficiency Savings</b>						
Residential	10,124	1,475	12,205	1,981	15,610	2,646
Commercial	27,490	6,173	32,124	8,009	32,994	9,266
Industrial	5,718	840	6,045	896	4,999	752
<b>Total Efficiency</b>	<b>43,332</b>	<b>8,489</b>	<b>50,374</b>	<b>10,886</b>	<b>53,603</b>	<b>12,664</b>
<b>Renewable Supply</b>						
Biomass	5,141	833	5,325	861	6,344	1,022
Fuel Cells	-	-	-	-	-	-
Hydropower	1,512	109	4,336	375	9,123	816
Landfill Gas	-	-	-	-	-	-
Municipal Solid Waste	-	-	682	91	1,421	190
Photovoltaics	-	-	-	-	-	-
Solar Thermal	175	-	181	-	189	-
Windpower	-	-	1,245	100	41,818	3,255
<b>Total Renewable</b>	<b>6,828</b>	<b>942</b>	<b>11,769</b>	<b>1,427</b>	<b>58,894</b>	<b>5,283</b>
<b>Total Efficiency Savings &amp; Renewable Supply</b>	<b>50,159</b>	<b>9,431</b>	<b>62,143</b>	<b>12,313</b>	<b>112,497</b>	<b>17,947</b>

<sup>10</sup>

*Wind Integration Study-Final Report*, prepared for Xcel Energy and the Minnesota Department of Commerce by EnerNex Corporation and Wind Logics, Inc., dated September 28, 2004, the Project Summary portion of which is included as Exhibit JI-4-A, at page 19.

**Table 6 - New York Statewide Economic Potential - High Avoided Costs**

	2007		2012		2022	
	Annual GWh	Summer Peak MW	Annual GWh	Summer Peak MW	Annual GWh	Summer Peak MW
<b>Energy Efficiency Savings</b>						
Residential	12,593	2,433	15,982	3,267	19,660	4,480
Commercial	30,273	7,021	35,340	8,988	36,847	10,225
Industrial	5,718	840	6,045	896	4,999	752
<b>Total Efficiency</b>	<b>48,584</b>	<b>10,294</b>	<b>57,367</b>	<b>13,151</b>	<b>61,506</b>	<b>15,457</b>
<b>Renewable Supply</b>						
Biomass	5,141	833	5,325	861	6,344	1,022
Fuel Cells	-	-	-	-	-	-
Hydropower	2,115	257	5,038	555	10,311	1,095
Landfill Gas	439	59	407	54	419	56
Municipal Solid Waste	-	-	682	91	1,421	190
Photovoltaics	-	-	-	-	-	-
Solar Thermal	175	-	181	-	189	-
Windpower	893	70	3,744	293	41,818	3,255
<b>Total Renewable</b>	<b>8,762</b>	<b>1,219</b>	<b>15,376</b>	<b>1,855</b>	<b>60,501</b>	<b>5,618</b>
<b>Total Efficiency Savings &amp; Renewable Supply</b>	<b>57,347</b>	<b>11,513</b>	<b>72,744</b>	<b>15,006</b>	<b>122,007</b>	<b>21,074</b>

Based on the results of this study, renewable resources have the technical and economic potential to provide between 1427 MW and 1855 MW of new capacity in New York State by 2012 and between 5283 MW and 5618 MW of new capacity by 2022. Energy Efficiency and renewable resources together have the technical and economic potential to provide between 12,313 MW and 15,006 MW in 2012 and between 17947 MW and 21074 MW in 2022. Clearly, this is far more than would be required to replace the approximately 2000 MW of capacity from Indian Point Units 2 and 3.<sup>11</sup>

The same conclusion is true for the energy that would be supplied by Indian Point Units 2 and 3 if their licenses are renewed. The same tables presented above show that renewable resources, alone have the potential to provide between 11769 and 15376 GWh of energy in 2012 and between 58894 and 60501 GWh of energy in 2022. Similarly, energy efficiency and renewable resources combined could provide between 62,143 GWh and 72,744 GWh in 2012 and between 112,497 GWh and 122,007 GWh in 2022.<sup>12</sup>

The 2003 study for NYSERDA also showed that a significant portion of the energy that could be provided by energy efficiency and renewable resources would be in downstate New York.<sup>13</sup> For example, the study found that by 2012, energy efficiency and renewable resources have a technical and economic potential of

<sup>11</sup> At Volume One, page 3-4.

<sup>12</sup> *Id.*

<sup>13</sup> *Id.* Figure 1.8, at page 3-7.

approximately 30,000 GWh just in Zones J and K, which represent New York City and Long Island. It similarly found that by 2022, energy efficiency and renewable resources have a technical and economic potential of more than 50,000 GWh just in these same areas of the state. Again, this would easily replace the energy that would be provided by Indian Point Units 2 and 3.

The May 2007 study, *New York's Solar Roadmap, A Plan for Energy Reliability, Security, Environmental Responsibility and Economic Development in New York State*<sup>14</sup>, has noted that a private-sector initiative launched in 2007 R&D, manufacturing, and industry leaders in New York State, has developed the strategic goal of increasing solar power deployment in the State from the current level of about 12 MW of grid-connected electricity as of January 2007 to over 2,000 MW by 2017.<sup>15</sup> This would provide about 5 percent of the peak electric capacity of the state.<sup>16</sup>

An October 2002 study by NYSERDA on *Combined Heat and Power, Market Potential for New York State*, has concluded that by 2012 there could be between 763.6 MW and 2,169.1 MW of combined heat and power in the state.<sup>17</sup> Between 525.4 MW and 1,319.7 MW of this combined heat and power could be in the Downstate area of the State.<sup>18</sup>

The new administration in New York State already is taking significant actions to increase the amount of energy efficiency and renewable resources:

New York State has announced the following major initiatives as part of their Clean Energy Agenda:

- **Reduce energy consumption.** Governor Spitzer has announced that New York will reduce energy consumption by 15 percent below the forecasted level in 2015 – this is the most aggressive target in the country. New York businesses can raise their profits and New York's families can reduce their utility bills by conserving energy. At the state level, government will lead by example and cut its own use of energy.
- **Invest in and develop renewable energy such as wind, solar, hydropower, and fuel cells.** The Spitzer-Paterson administration will ensure New York will meet the current goal of obtaining 25 percent of our energy from renewable resources by 2013, and the Task Force will evaluate whether to expand this goal. In addition,

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<sup>14</sup> This study is available at [http://www.neny.org/download.cfm/NENY\\_Membership\\_Application.pdf?AssetID=225](http://www.neny.org/download.cfm/NENY_Membership_Application.pdf?AssetID=225)

<sup>15</sup> Executive Summary, at page 1.

<sup>16</sup> *Id.*, at page 2.

<sup>17</sup> *Combined Heat and Power, Market Potential for New York State*, NYSERDA, Final Report 02-12, October 2002, Table ES-4, at page ES-9.

<sup>18</sup> *Id.*

we must continue to support research and development in this area, and encourage renewable energy businesses to locate in New York.

- **Clean Energy Siting Bill.** Streamlining the state approval process for renewable and clean energy sources is an essential part of our effort. Governor Spitzer proposed a new power plant siting law (“Article X”) that would provide a streamlined and expedited review process for wind projects and other clean energy sources.<sup>19</sup>

The State also has convened a Renewable Energy Task Force to evaluate, among other issues, whether the state’s Renewable Portfolio Standard should be increased to 30 percent as a result of the Governor’s announced “15 by 15” energy efficiency program.

## **POWER PLANT REPOWERING**

Entergy did not consider the potential repowering of older existing power plants as an alternative to the relicensing of Indian Point Units 2 and 3.

Repowering a generation facility means replacing a plant's old, inefficient and polluting equipment with newer, more efficient equipment. Today, virtually all repowering projects replace old equipment with combined-cycle combustion turbines (CCCTs). CCCTs generate electricity in two stages. In the first stage, fuel is burned to operate a gas turbine generator, and in the second stage, excess heat from the gas turbine is used to drive a steam turbine and generate additional electricity. This two-stage process can turn 50 percent or more of the fuel energy into electricity. Repowering has become commonplace in the electric industry since the early 1990s. One repowering project in the Hudson River Valley was PSEG’s Bethlehem Energy Center outside Albany. Completed in 2005, this project now consists of 793 MW of combined-cycle generating capacity, which includes a net increase of 400 MW relative to the old Albany Steam Plant that was replaced.

In practice, repowering can be done in at least two ways, either by rebuilding and replacing part or all of an existing plant or by closing down an existing power plant, building a new unit next to it and reusing the existing transmission and fuel facilities.

Repowering older power plants provides a number of important environmental and electric system reliability benefits: improved plant availability, lower plant operating and maintenance costs; increased plant capacity and generation; reduced facility heat rates which lead to significantly more efficient fuel use; reuse of industrial sites; up to 99 percent reductions in water intake and related fish impacts; and large reductions in air emissions, both overall and in terms of emissions per MWh of electricity.

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<sup>19</sup>

Available from [http://www.ny.gov/governor/press/lt\\_conservation.html](http://www.ny.gov/governor/press/lt_conservation.html).

A recent study on repowering KeySpan’s generating facilities on Long Island by the Center for Management Analysis at Long Island University concluded that repowering these facilities would provide cost effective generating capacity to carry Long Island at least into the next 20 to 40 years and beyond, and would provide “compelling” environmental benefits:

Improvements in efficiency from about 35 percent to close to 60 percent in the conversion of fuel to electricity can be achieved. The resulting reduction in fuel burned for a given amount of generation will be significantly less nitrogen oxides and carbon monoxide emitted. Modern combined cycle units have state of the art emission control systems in contrast to the older steam electric units with no such controls. The re-powered units achieve emission reductions immediately since they replace higher emitting, older units that would likely continue to operate in an expansion program of new greenfield projects.<sup>20</sup>

The study by the Center for Management Analysis concluded that converting the major plants on the KeySpan system to combined cycle could increase Long Island’s electric supply by about 2,000 MW.<sup>21</sup> Clearly, the repowering of these existing power plants on Long Island could replace the approximate 2,000 MW of capacity provided by Indian Point Units 2 and 3.

Reliant Energy also received an Article X certificate to repower its aging Astoria Generating facility. This repowering would add another 1,816 MW of combined cycle capacity to the electric system in New York City. This would represent an increase of approximately 650 MW over the capacity of the existing Astoria facility. The retirement of Indian Point Units 2 and 3 would create an incentive for the completion of this repowering project.

Detailed engineering and economic analyses must be performed to determine the optimum size of the repowered unit and the extent to which existing facilities can be refurbished and reused. The types of existing facilities that can be refurbished and reused include boilers, turbine generators, condensers, transmission switchyards, and other auxiliary plant equipment. The reuse of this equipment can lower the cost of building the repowered facility as compared to the cost of constructing a new unit at a new site.

There are a number of older fossil-fueled power plants situated on the river between Albany and New York City: Bowline Point, Roseton, and Danskammer. As noted earlier, one older plant along the river, the old Albany Station, has been replaced with modern power generation equipment. However, the units at the Bowline, Roseton and Danskammer fossil-fueled plants utilize older power generating technology, which is less efficient and has far greater environmental impacts than new generating systems. Most of the boilers and generating units in these four plants are over 25 years old – three of them are over 45 years old – and none of them has been retrofitted with post-combustion emission controls or modern

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<sup>20</sup> *The Feasibility of Re-Powering KeySpan’s Long Island Electric Generating Plants to Meet Future Energy Needs*, Long Island University, Center for Management Analysis, August 6, 2002, at page 8.

<sup>21</sup> *Id.*, at page 78.

cooling systems that minimize water use from the river. Repowering these plants with new combined cycle technology could add additional generating capacity to replace Indian Point at the same time that it would provide significant economic and environmental benefits.

## **TRANSMISSION SYSTEM ENHANCEMENTS AND UPGRADES**

Entergy has failed to adequately consider transmission system enhancements and upgrades as part of the portfolio of options for replacing the capacity and energy from Indian Point Units 2 and 3. Such enhancements and upgrades could increase the capability to import power into the Hudson River Valley and Downstate New York from New England, PJM<sup>22</sup> or upstate New York.

For example, at least two new transmission links between New York and New Jersey have been proposed. Both of these are in the interconnection queue at the New York ISO. One of these is the Hudson Transmission Project that would provide a new controllable line into New York City rated at 600 MW.<sup>23</sup> A second project, the 550 MW Harbor Cable Project and Generating Portfolio, would provide a full controllable transmission pathway from generating sources in New Jersey to New York City.<sup>24</sup>

At the same time, the 2005 Levitan & Associates study identified three possible transmission alternatives to the retirement of Indian Point Units 2 and 3. The first would include retirement with the construction of two physically separate 500 kV circuits between the Capitol District around Albany to the downstate grid in New York City. Each of the circuits would be controllable and would be able to transmission 1,000 MW of power for a total of 2,000 MW.<sup>25</sup> A third proposed project would be the 300 MW Linden Variable Frequency Transformers that would be physically located adjacent to the Linden Cogen plant in northern New Jersey. It would result in a variable 300 MW tie between PJM and New York City.<sup>26</sup>

The second transmission alternative identified by Levitan & Associates would be to upgrade the existing 345 kV New Scotland-Leeds circuit and the 345 kV Leeds-Pleasant Valley circuit, and construct a new 345 kV line from New Scotland to Pleasant Valley. This would increase the UPNY-SENY interface transfer capability by approximately 600 MW.<sup>27</sup>

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<sup>22</sup> PJM is the interconnected regional electric system in 13 states and the District of Columbia. New Jersey and Pennsylvania are two of the state's within PJM.

<sup>23</sup> New York Independent System Operator, *The Comprehensive Reliability Plan 2007, A Long-Term Reliability Assessment of New York's Bulk Power System*, Final Report, September 2007, at page 27.

<sup>24</sup> *Id.*

<sup>25</sup> *Indian Point Retirement Options, Replacement Generation, Decommissioning/Spent Fuel Issues, and Local Economic/Rate Impacts*, prepared for the County of Westchester and the County of Westchester Public Utility Service Agency, by Levitan & Associates, Inc., June 9, 2005, at pages 35 and 36.

<sup>26</sup> *Id.*

<sup>27</sup> *Id.*, at pages 36 and 37.



Finally, the third transmission alternative would be to convert the existing 345 kV Marcy-New Scotland circuit to a double circuit and to rebuild the New Scotland station to a breaker-and-a-half design. This would increase the Central-East transfer capability by approximately 650 MW and increase the transmission capability into New York City by approximately 450 MW.<sup>28</sup>

Levitan & Associates also identified a fourth transmission alternative that would upgrade the interconnections between New York and the PJM system by re-conductoring the existing transmission paths from Ramapo to Buchanan and/or constructing a new dedicated (overhead or underground) transmission line from Ramapo to Buchanan. However, Levitan & Associates were unsure of the amount by which this alternative would increase the Total East transfer capability into New York State.

### **NEW GENERATING FACILITIES**

A number of proposed power plant projects received certificates under New York's now-expired Article X statutes. However, some of these projects have not been built because they were unable to secure the needed financing. The Governor of New York has proposed requiring utilities to enter into long-term contracts with prospective suppliers. This would enable plant developers to limit risks, gain the confidence of investors and obtain the financing to build their projects.

The following is list of the approved projects in the Hudson River Valley and downstate New York that have not been built:

- Besicorp – Empire State Newsprint Project – 505 MW – Rensselaer County
- Bowline Unit 3 – 750 MW – Rockland County
- Reliant Energy Astoria Repowering Project – 1816 MW total (net addition 652 MW) – Queens County
- Spagnoli Road Energy Center – 250 MW – Suffolk County

The addition of these units would add over 2,100 MW of new generating capacity.

Other new generating facilities, totaling 1400 MW of new capacity, have been proposed for downstate New York including:

- A second Astoria Repowering Project, submitted by NRG Power Marketing, would add 500 MW (375 MW net) of new combustion turbine power in Queens by 2011.<sup>29</sup>
- A 600 MW combined cycle unit at Arthur Kill on Long Island by 2012.<sup>30</sup>

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<sup>28</sup> Id., at page 37.

<sup>29</sup> New York Independent System Operator, *The Comprehensive Reliability Plan 2007, A Long-Term Reliability Assessment of New York's Bulk Power System*, Final Report, September 2007, at page 27.

<sup>30</sup> Id.

- A 300 MW Peaking Facility at Indian Point, proposed by Entergy Nuclear Power Marketing. This project would be in service by mid-2011.

As explained in the 2005 *Indian Point Options* study by Levitan & Associates, it is reasonable to expect that the retirement of Indian Point would encourage developers to complete the approved but not yet built projects:

Project developers are keenly tuned to market dynamics in New York. They would realize that retiring IP would cause market energy and capacity values to increase across the downstate region. These price signals would be important, given IP's size and location, to encourage the development of new generation and/or transmission projects that would replace the lost capacity. These new generation projects could include decentralized and renewable resource options. If the retirement of IP were announced in advance, developers would be able to calculate the economic feasibility of their projects and pursue those that make financial sense in time to maintain the state's reliability requirement. In addition, utilities in the downstate regions might offer long-term PPAs for new replacement generation. PPAs offer generators market certainty and reduce price risk, improving the opportunity for owners to obtain debt and equity financing in today's skittish financial markets.

The developers' ability to respond to market price signals and the utilities' interest in contracting for new generation are central to our analysis. We believe that developers would require a minimum of three-to-four years to plan, permit, and construct a gas-fired combined cycle project. Perhaps six months to a year could be shaved off the time for a simple cycle project. The early project development work can often be accomplished at minimal cost, even if a formal retirement plan was not announced, in order for the developer to get a "head start" on competitors. Such tasks encompass conceptual design, site control, preliminary fuel supply and power offtake arrangements, and initial permit applications. The remaining project development and construction time would be approximately three years for a combined cycle plant and less for simple cycle. Thus we would recommend that any voluntary retirement be announced at least three-to-four years in advance, to give the market enough time to develop replacement capacity....

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The existing NRC license expiration dates of 2013/15 define our Base Case scenario against which we evaluate other options. If Entergy announced an agreement to retire IP2&3 on those dates at least three, and preferably four years in advance, there would be



more than enough time for project developers and downstate utilities to respond.<sup>31</sup>

It is important to realize that gas supply will not be a critical factor in closing Indian Point. According to the 2006 National Academy of Sciences study, “ *Committee on Alternatives to Indian Point for Meeting Energy Needs*, at page 5, replacing both Indian Point units would ultimately require an additional 1300-1400 MW of new gas-fired generating capacity. Conservatively assuming a heat rate of 8000 btu/KWh, under peak conditions providing 1400 MW would require a gas supply of 0.26 bcf per day, or about 16% of the combined capacity of the new LNG facilities being developed in Eastern Canada and Massachusetts. There will be more than enough slack in the system to supply the gas needed for additional generating facilities to replace Indian Point from existing and new sources outside New York State.

New gas supplies will be available in the northeastern United States and eastern Canada from new LNG facilities that are expected to be on-line within the next few years. (The Canaport LNG terminal is expected to begin receiving deliveries and transporting gas to the northeast United States through the upgraded Maritimes and Northeast pipeline as soon as 2008) The combined capacity of these LNG terminals would be approximately 1.73 billion cubic feet (bcf) per day, of which 0.73 bcf would be delivered from the Canaport facility (Nova Scotia) and 1.0 bcf from two offshore facilities in Massachusetts. These facilities are well advanced in the permitting process (Canaport is under construction), and they rely on known and proven LNG transfer and regassification technologies.

Note that the two proposed LNG import terminals, located in Massachusetts, to serve the northeast market have been approved by the Governor of Massachusetts.<sup>32</sup> In addition, the Repsol Energy North America Corporation, developer of the Canaport LNG facility in Saint John, New Brunswick, has filed a notice with FERC clarifying that they intend and expect to deliver 0.73 bcf of gas into the northeastern United States.<sup>33</sup>

The addition of these new LNG facilities in the northeastern United States and eastern Canada will free-up additional pipeline capacity into the New York area from the south so that more gas could be delivered to the Westchester Area. Today, New England gets much of its gas supply from the Algonquin Pipeline which passes through Connecticut from the southeast corner of the state to the northwest corner. This transport—through function accounts for about 90% of the activity on Algonquin in this region. Once additional LNG-based supplies are available in New England, much of that existing pipeline capacity would be available for delivering gas supplies from domestic sources (i.e., the Gulf of Mexico) to the New York area. In addition, decreased competition for this pipeline capacity means that

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<sup>31</sup> *Indian Point Retirement Options, Replacement Generation, Decommissioning/Spent Fuel Issues, and Local Economic/Rate Impacts*, prepared for the County of Westchester and the County of Westchester Public Utility Service Agency, by Levitan & Associates, Inc., June 9, 2005, at pages 30 and 31.

<sup>32</sup> [http://www.boston.com/news/local/articles/2006/12/20/governor\\_approves\\_2\\_lng\\_ports/](http://www.boston.com/news/local/articles/2006/12/20/governor_approves_2_lng_ports/)

<sup>33</sup> [http://elibrary.FERC.gov/idmws/file\\_list.asp?accession\\_num=20070111-0066](http://elibrary.FERC.gov/idmws/file_list.asp?accession_num=20070111-0066)

transportation costs to the New York area are likely to decrease. Thus the availability of new LNG terminals in New England and eastern Canada will provide a benefit to New York and Connecticut in terms of availability of supply, and likely in terms of price, even if the physical molecules of gas are not delivered to the region from those new LNG facilities.

In conclusion, the LNG terminals in Canada and Massachusetts will all add to the available gas supplies for New York and Connecticut. They can do this either directly, by transporting gas to the region through the interstate pipeline system, or indirectly, by releasing pipeline capacity that would otherwise be reserved for moving supplies through the region and northward.<sup>34</sup>

## **CONCLUSION**

In conclusion, the capacity and energy provided by Indian Point Units 2 and 3 can be replaced if the Units are not relicensed. In particular, energy efficiency, renewable resources, the repowering of older generating facilities, transmission upgrades and new natural gas-fired generating facilities represent viable alternatives to the relicensing of Indian Point. Substantial reductions in peak demand and energy requirements will be achieved by 2013 under the state's newly announced "15 by 15" Clean Energy Plan. Significant amounts of new renewable resources will be available as a result of the state's renewable energy portfolio standard and other initiatives. In addition, thousands of megawatts ("MW") of new generating capacity can be provided by the repowering (i.e., rebuilding) of older generating facilities both along the Hudson River and in the downstate area of the state in New York City and on Long Island. At the same time, transmission system upgrades also can increase the amounts of power that can be provided to the downstate region of the State. Finally, there is the potential for the addition of several thousand megawatts of new generating capacity in the Hudson River Valley and in downstate New York.

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See *The Proposed Broadwater LNG Import Terminal: An Analysis and Assessment of Alternatives*, March 2006 and *The Proposed Broadwater LNG Import Terminal Update of Synapse Analysis*, January 19, 2007, both are available at [www.synapse-energy.com](http://www.synapse-energy.com).