

BEFORE THE
STATE OF RHODE ISLAND
PUBLIC UTILITIES COMMISSION

Electric Distribution Rate Design Proposal	:	
Proposal Pursuant to R.I. Gen. Laws	:	Docket No. 4568
§ 39-26.6-24 of the Narragansett Electric	:	
Company d/b/a National Grid	:	

DIRECT TESTIMONY

OF

RICHARD S. HAHN

REGARDING THE ELECTRIC DISTRIBUTION RATE DESIGN PROPOSAL
Of NARRAGANSETT ELECTRIC COMPANY d/b/a NATIONAL GRID

ON BEHALF OF THE

RHODE ISLAND DIVISION OF PUBLIC UTILITIES AND CARRIERS

January 6, 2016

1 **I. INTRODUCTION**

2 **Q. Please identify yourself for the record.**

3 A. My name is Richard S. Hahn. I am a Principal Consultant for Daymark Energy Advisors,
4 Inc. (formerly known as La Capra Associates, Inc.). My business address is Daymark
5 Energy Advisors, One Washington Mall, Boston, MA 02108.

6 **Q. Mr. Hahn, please summarize your experience and qualifications.**

7 A. I received my Bachelor's in Science, Electrical Engineering, in 1973, and my Master's in
8 Science, Electrical Engineering, in 1974, both from Northeastern University. I received
9 my Master's in Business Administration from Boston College in 1982. Since joining
10 Daymark Energy Advisors in 2004, I have worked on many projects related to investments
11 in energy infrastructure, energy markets, forecasts of wholesale market prices, utility
12 resource planning projects, rates, power procurement and portfolio management, electric
13 transmission projects, and asset valuations. Prior to joining La Capra, I worked at NSTAR
14 Electric & Gas (formerly Boston Edison Company) from 1970 to 2003. Throughout my
15 career, I have gained and demonstrated considerable experience and expertise in utility
16 planning activities and project evaluation. I am a registered professional electrical engineer
17 in the Commonwealth of Massachusetts. My resume is provided in Exhibit IV attached to
18 this testimony.

19 **Q. Have you previously prepared testimony before the Rhode Island Public Utilities**
20 **Commission ("Commission")?**

21 A. Yes, I have testified on behalf of the Division of Public Utilities and Carriers ("the
22 Division") before this Commission on numerous occasions. Additional detail, including
23 the dockets in which I have previously testified, can be found in my resume in Exhibit IV.

Q. What is the purpose of your testimony in this proceeding?

A. Daymark Energy Advisors has been retained by the Division to (a) review and comment on the rate design proposal submitted by the Narragansett Electric Company (“NECO” or the “Company”) and (b) review and comment on, where appropriate, the direct testimony filed by intervenors. In this testimony, I respond to the Access Fee proposed by the Company, and my testimony of this subject should be considered as complementary to the testimony of Dr. Alvaro Pereira, filed on behalf of the Division.

Q. Please summarize your overall conclusions and recommendations regarding the Company’s Proposal.

A. Regarding the Company’s proposals concerning the Access Fee, I make the following recommendations:

- The Commission should deny NECO’s proposal to implement an Access Fee for Stand Alone Generators (“SAGs”) at this time.
- The Company should monitor the impact of all DG facilities connected to its distribution system to identify any adverse impacts on its ability to operate its distribution system in a safe, reliable, cost effective manner, and record the costs to address those impacts.
- With a substantial expansion of DG facilities established as a state policy, the concept of who pays for the distribution system should also be a policy decision in Rhode Island. I recommend that interested parties engage in a discussion of these issues outside of a specific rate filing. There are several possible forums, such as technical sessions in front of the Commission or collaborative

1 negotiations among the parties to this proceeding. In the briefs to be submitted
2 in this proceeding, parties could suggest specific forums to be used.

3
4 **II. OVERVIEW OF THE PROPOSED ACCESS FEE**

5 **Q. Can you briefly describe the Access Fee proposed by the Company?**

6 A. In its July 2015 filing, the Company proposes to assess a new charge to all SAGs. This
7 Access Fee is a charge per KW-month for SAGs connected to primary and secondary
8 distribution circuits. It is based upon the nameplate capacity and a “capacity factor”, which
9 varies by technology but is fixed for all facilities within a technology group. The monthly
10 Access Fee equals the project’s nameplate capacity in KW multiplied by the estimated
11 capacity factor multiplied by the charge per KW-month. The proposed charge is \$5.00 per
12 KW-month for primary circuits and \$7.50 per KW-month for secondary circuits. NECO
13 asserts that this fee is needed because SAGs use its distribution system but do not pay a
14 fair share of costs. The Company has also expressed concern about DG facilities causing
15 inequities in revenue recovery. Any revenue collected from the SAGs via the proposed
16 Access Fee will be credited to customers via the Revenue Decoupling Mechanism
17 (“RDM”).

18 **Q. What is a SAG?**

19 A. The Company defines a SAG as a Distributed Generation (“DG”) facility that is directly
20 connected to the Company’s distribution system and has no associated on-site load other
21 than parasitic load. For a SAG, the vast majority of its electrical production is delivered to
22 the grid and represents a sale for re-sale. This would be in contrast to a net metered DG

1 facility, where the electrical generation is used to offset or reduce a retail customer's
2 purchase of electricity from the Company.

3 **Q. Has the Company made any changes to its proposed access fee since its original filing?**

4 A. The Company has proposed to grandfather or exempt all existing SAGs from this proposed
5 Access Fee. With this modification, the Access Fee would apply only to new SAGs that
6 connect after the Access Fee is approved.

7
8 **III. ASSESSMENT OF THE PROPOSED ACCESS FEE**

9 **Q. What programs exist in Rhode Island for DG?**

10 A. It is my understanding that Rhode Island has several programs to encourage the
11 implementation of DG facilities. These programs include the Long-Term Contracting for
12 Renewable Energy ("LTCRE"), the net metering tariff, the DG Standard Contracts
13 program, and the Renewable Energy Growth program. I also understand that some DG
14 facilities may be designated as Qualifying Facilities ("QFs"). I believe that all of these
15 programs except for the net metering tariff could result in SAGs connected to the
16 Company's distribution system.

17 **Q. How much SAG capacity is connected to the Companies distribution system?**

18 A. On November 12, 2015, the Company filed its LTCRE cost recovery factor for the first six
19 months of 2016. This filing lists 25 projects with a total capacity of 55 MW, each of which
20 have asset IDs assigned by ISO-NE. This includes the RI LFG Genco project and the Black
21 Bear Hydro project, which are not connected to the Company's distribution system.
22 Removing these project reduces the total to 19 MW. Three of these remaining 23 projects
23 are listed as net metered facilities in the ISO-NE Seasonal Claimed Capability report.

1 Removing these three projects further reduces the total to 16 MW. Exhibit I attached to
2 this testimony provides a summary of this information. The Company's response to DIV
3 2-6 lists 23 SAG projects with a capacity of 17 MW that are currently connected to the
4 Company's distribution system. Exhibit II attached to this testimony provides a summary
5 of this information. Although the information in these sources does not match up exactly,
6 it does provide a reasonable basis to conclude that there are 17 MW of SAGs currently
7 connected to the Company's distribution system that produce less than 25,000 MWH
8 annually.

9 **Q. Has the Company provided any estimates of the growth in SAGs?**

10 A. In response to DIV 1-18, the Company has estimated that by September 2017, the SAG
11 capacity connected to its distribution system will increase to 37 MW from 44 projects.
12 Exhibit III provides a summary of this information. And, Schedule NG-5 attached to the
13 testimony of Mr. Zschokke and Ms. Lloyd shows that by 2020, installed DG capacity is
14 estimated to reach 205 MW. I understand that this 205 MW estimate includes all type of
15 DG, not just SAGs.

16 **Q. How much electric energy does Rhode Island currently use?**

17 A. Based upon hourly load data from ISO-NE for 12 months ending November 30, 2015,
18 Rhode Island required 8,165,000 MWH and its annual peak load was 1,749 MW. Thus,
19 DG and to a lesser degree SAGs are likely to represent a small but growing and important
20 resource for Rhode Island relative to Rhode Island total energy needs.

21 **Q. How would you characterize current Rhode Island SAG projects?**

22 A. Based upon the Company's response to data requests, NECO purchases all of the output of
23 all existing SAGs connected on behalf of its customers. These purchases are made pursuant

1 to the legislatively-mandated and Commission-approved programs. There are no SAGs
2 connected to the NECO distribution system whose output is sold out of state. NECO takes
3 delivery of the output of SAGs at the revenue meter, which is likely on or close to the
4 property upon which the SAG is built. Before any SAG connects to the NECO distribution
5 system, NECO performs an extensive interconnection study. If any system upgrades are
6 required to accommodate the SAG, NECO will require the SAG to pay for the capital costs
7 of those upgrades. NECO does not currently charge SAGs for any on-going O&M costs
8 on the system upgrade investments. These costs, if any, are included in NECO's total
9 O&M, and recovered via existing rate mechanisms. In addition, NECO reserves the right
10 to charge SAGs for any future capital costs related to interconnection should they be
11 required.

12 **Q. Based upon your review of the filing, what is your assessment of the proposed Access**
13 **Fee?**

14 A. For reasons discussed more fully below, based on the evidence and information I have seen
15 thus far, I believe the Access Fee is not appropriate at this time.

16 **Q. Are Stand Alone Generators actually using the distribution system to transmit power**
17 **owned by the SAG's?**

18 A. NECO asserts that SAGs use its distribution system without paying a fair share of the costs.
19 However, because NECO takes delivery of the power at the revenue meter located on or
20 near the property where the SAG is located, the SAG is not using NECO's distribution
21 system. Rather, NECO is using its distribution system to wheel power it has taken title to
22 on behalf of its retail customers, which already pay for the use of the distribution system.
23 The Company may view this position as a minor technicality, but I believe that it is an

1 important distinction, one that could determine the appropriateness of fees charged for
2 alleged use of the distribution system. If a SAG used the NECO distribution system to
3 deliver the output of the SAG to an out-of-state buyer (i.e., outside of Rhode Island), then
4 that SAG would be using NECO's distribution without paying anything. In such instances,
5 some payment, based upon either an access fee or a full retail rate, might be appropriate.
6 However, there are currently no such SAGs, and in my opinion, it is unlikely that such an
7 SAG would be developed in the near future.

8
9 I note that all generation projects whose output is purchased by the Company on behalf of
10 its retail customers use or rely upon the NECO distribution system. For example, NECO
11 purchases the output of the Black Bear Hydro project which is located in Maine, and uses
12 its distribution system to deliver that output to its customers, but the Company does not
13 propose charging such projects an Access Fee.

14 **Q. Is DG on NECO's system causing problems at present?**

15 A. NECO has not provided any evidence that DG on the distribution system is causing any
16 problems. As shown in Exhibit II, none of the existing SAG projects have caused circuit
17 ratings to be exceeded. Most, if not all, of the SAG projects have reduced power flow.

18 **Q. Is the proposed Access Fee cost based?**

19 A. The proposed charge does not appear to be cost based. It might be possible to accurately
20 determine the incremental O&M for the capital investment associated with the
21 interconnection upgrades for each SAG. Therefore, it might be possible to establish a cost-
22 based, non-arbitrary fee that is fair to all SAGs, but the Company has not done so. The
23 Company asserts that the Access Fees are set at levels that reflect the per unit demand-

1 related revenue requirements for Rates G-32/G-62 (primary) and Rate G-02 (secondary).
2 However, the Company has not shown that SAGs would belong to these rate classes or that
3 they should be charged a full demand rate. In addition, the Company has not shown that
4 the current situation, where retail customers pay for any such costs, is unacceptable.

5 **Q. Would NECO's retail customers benefit from the imposition of the proposed Access**
6 **Fee through the additional revenues provided by SAG's?**

7 A. The rates for purchases made under the DG programs are either the cost-based ceiling
8 prices for smaller facilities or bid prices for larger facilities. It would be unfair to bidders
9 to add an access fee cost without increasing the ceiling prices. Under the CREST model,
10 ceiling prices would increase if a new access fee became part of the costs to the SAG. Bid
11 prices would also likely increase to accommodate this new charge. Either way, NECO's
12 customers will pay more for DG power, and receive a credit for any Access Fee revenues
13 via the RDM. With the Company's proposal to grandfather existing SAGs, there will be
14 no short-term Access Fee revenues to credit in the RDM. Thus, NECO's customers will
15 pay a comparable amount with or without the Access Fee.

16 **Q. Has there been any analysis performed of any potential benefits connecting SAGs to**
17 **the distribution system?**

18 A NECO does not appear to have considered or quantified the benefits of SAGs connected to
19 its distribution system. SAGs can reduce the power flow on distribution circuits, so those
20 same assets may be used to serve more customers. This benefit may more than offset any
21 incremental O&M for the interconnection upgrades, but the company has not provided any
22 analysis of such situations.

1 **Q. How are generators generally treated for use of transmission facilities in terms of**
2 **paying transmission owners?**

3 A. Generators connected to the ISO-NE transmission system pay the capital costs of any
4 system upgrades required for interconnection, but generally do not pay for any incremental
5 O&M associated with those facilities. The Company has identified some generators that
6 make payments for on-going O&M costs at the transmission level. However, these
7 facilities pay less than 1% of all annual revenues for New England Power Company. It is
8 a well-established principle in ISO-NE that load pays for transmission, not generators. The
9 current situation in Rhode Island without the Access Fee is very comparable to the
10 transmission-interconnected generators. Instituting the Access Fee will treat SAGs
11 different from how transmission-interconnected generators are currently treated in the ISO-
12 NE tariffs.

13 **Q. Do you have any other observations relative to the Access Fee proposal?**

14 A. The Access Fee may be considered as an impediment to additional DG facilities, which
15 might not comport with Rhode Island legislation to encourage such facilities. Other parties
16 have testified to this point. The Company's proposal to grandfather existing SAGs may
17 help mitigate this impact, but it is unclear how it will affect future DG projects.

18
19 The Company has expressed concern that DG projects may create inequities in revenue
20 recovery. This has caused them to proposed recovering more of its revenue requirement
21 from fixed as opposed to variable charges. But, SAGs do not reduce retail sales, as do net
22 metering projects, so this should not be a reason to implement an Access Fee on SAGs at
23 this time.

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Lastly, I note that the Company did not provide advance notice of its intent to propose the Access Fee in this rate filing. This may have created a situation that led to considerable opposition to the concept.

Q. Is it appropriate for the Company to be concerned about the impact of substantial future growth in DG facilities?

A. Yes. I believe that it is appropriate for the Company to look into the future and try to ensure that it is able to continue to operate its distribution system in a safe, reliable, cost effective manner.

Q. Is the Company’s proposed Access Fee required at this time to meet those objectives?

A. I do not believe that the proposed Access Fee is necessary at this time to meet those objectives of being able to operate its distribution system in a safe, reliable, cost effective manner. It appears that NECO’s proposal to implement an Access Fee for SAGs is premature, unnecessary, and will produce no benefit to ratepayers. If and when a SAG connects to NECO’s distribution system and delivers its output to an out-of-state buyer, an access fee or other charge for such use of the distribution system may be warranted. Since no such facilities exist and none are expected, there is no need for such a provisions at this time.

Q. What do you recommend?

A. I recommend the following.

- The Commission should deny NECO’s proposal to implement an Access Fee for SAGs at this time.

- 1 • The Company should monitor the impact of all DG facilities connected to its
2 distribution system to identify any adverse impacts on its ability to operate its
3 distribution system in a safe, reliable, cost effective manner, and record the
4 costs to address those impacts.
- 5 • With a substantial expansion of DG facilities, the concept of who pays for the
6 distribution system should be a policy decision in Rhode Island. I recommend
7 that interested parties engage in a discussion of these issues outside of a specific
8 rate filing. In its rebuttal testimony filed on December 16, 2015, the Company
9 stated that it disagrees with that approach.¹ I disagree with the Company's
10 resistance to this approach. Given the numbers of parties who oppose the
11 Access Fee, this approach is a reasonable way to proceed. There are several
12 possible forums, such as technical sessions in front of the Commission or
13 collaborative negotiations among the parties to this proceeding. In the briefs to
14 be submitted in this proceeding, parties could suggest specific forums to be
15 used.

16
17 **IV. CONCLUSIONS**

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

19 **A.** Yes it does. If additional information becomes available, I will amend or expand this
20 testimony as appropriate.

¹ See pages 64 and 65 of the joint rebuttal testimony of Mr. Zschokke, Ms. Lloyd, and Mr. Roughan.

Exhibit I

Rhode Island Long-Term Contracting For Renewable Energy Projects

January 2016 to June 2016

No.	Project	Asset No.	MW	COD	Factor	Est'd MWH	Price	SCC Generator Name	SCC Lead Participant	Net-Metered
1	RI LFG Genco	40054	32.100	5/28/2013	85%	119,508.3	\$132.24	JOHNSTON LFG TURBINE PLANT	Rhode Island Engine Genco, LLC	No
2	Black Bear Orono B Hydro	38083	3.958	11/22/2013	90%	15,602.4	\$96.57	ORONO B HYDRO	Black Bear Hydro Partners, LLC	No
3	Forbes Street Solar	43762	3.710	12/20/2013	14%	2,275.0	\$239.00	FORBES STREET 1-02914PV3000DG	The Narragansett Electric Comp	No
4	West Davisville Solar	43716	2.340	12/6/2013	14%	1,434.9	\$236.99	NEXAMP-02852PV2000DG	The Narragansett Electric Comp	Net-Metered
5	Con Edison Development Plain Mtg House	43512	2.000	7/19/2013	14%	1,226.4	\$275.00	WEST GREENWICH - 02817PV2000DG	The Narragansett Electric Comp	No
6	Johnston Solar	47357	1.700	8/3/2015	14%	1,042.4	\$175.00	JOHNSTON SOLAR-02919PV1375DG	The Narragansett Electric Comp	No
7	Wind Energy Dev. NK Green LLC	42394	1.500	3/1/2013	24%	1,576.8	\$133.50	WINDENERGYDEV-NKINGSTOWN-WIND	The Narragansett Electric Comp	No
8	100 Dupont Solar	44003	1.500	3/25/2014	14%	919.8	\$209.00	ALTUS-02907PV1225DG	The Narragansett Electric Comp	No
9	Brickle Group Solar Project	46911	1.084	12/4/2014	14%	664.7	\$184.90	NEXTSUN ENERGY-02896PV850DG	The Narragansett Electric Comp	No
10	ACP Land LLC 28 Jacome Way	43527	0.500	7/18/2013	14%	306.6	\$316.00	STUART THOMAS - 02842PV500DG	The Narragansett Electric Comp	No
11	35 Martin Solar	44006	0.500	3/27/2014	14%	306.6	\$316.00	ALTUS 2-02864PV450DG	The Narragansett Electric Comp	No
12	0 Martin Solar	44005	0.500	3/27/2014	14%	306.6	\$316.00	ALTUS 1-02864PV450DG	The Narragansett Electric Comp	No
13	North Kingstown Solar 1720 Davisville Rd.	47487	0.500	10/20/2015	14%	306.6	\$190.00	N KINGSTOWN SOLAR-02852PV495DG	The Narragansett Electric Comp	No
14	Comtram Cable	43586	0.499	9/30/2013	14%	306.0	\$316.00	COMTRAN CABLE-02864PV400DG	The Narragansett Electric Comp	No
15	CCI New England 500 kW	43607	0.498	10/25/2013	14%	305.4	\$316.00	COX PRISMTH-02871PV500DG	The Narragansett Electric Comp	No
16	Nexamp 76 Stilson Rd.	47020	0.498	2/28/2015	14%	305.4	\$194.88	NEXAMP-02898PV499DG	The Narragansett Electric Comp	No
17	Gannon & Scott Solar	44010	0.406	4/29/2014	14%	249.0	\$284.00	GOLDEN-02920PV300DG	The Narragansett Electric Comp	No
18	All American Foods Solar	46721	0.331	10/24/2014	14%	203.0	\$284.00	ALL AMERICAN-02852PV250DG	The Narragansett Electric Comp	No
19	225 Dupont Solar	44004	0.300	3/25/2014	14%	184.0	\$316.00	ALTUS-02907PV300DG	The Narragansett Electric Comp	No
20	T.E.A.M. Inc. Solar	46913	0.182	12/11/2014	14%	111.6	\$288.00	WOONSOCKET-02895PV190DG	The Narragansett Electric Comp	No
21	CCI New England 181 kW	43921	0.181	2/27/2014	14%	111.0	\$316.00	COXCOM-02893PV135DG	The Narragansett Electric Comp	Net-Metered
22	Conanicut Marine Services (CMS) Solar	43685	0.128	10/21/2013	14%	78.5	\$288.00	CONANICUT MARINE-02835PV120DG	The Narragansett Electric Comp	Net-Metered
23	Randall Steere Farm	46998	0.091	3/18/2015	14%	55.8	\$299.49	STEERE ELECTRIC-02814PV72DG	The Narragansett Electric Comp	No
24	Newport Vineyards Solar	46917	0.053	12/15/2014	14%	32.5	\$299.50	NEWPORT VINEYARDS-02882PV50DG	The Narragansett Electric Comp	No
25	SER Solar 23 Appian Way	46926	0.052	12/17/2014	14%	31.9	\$277.57	STILLWATER-02917PV56DG	The Narragansett Electric Comp	No
Total			55.111			147,451.0				
Total without RI LFG Genco & Black Bear			19.053			12,340.3				
less net metered facilities per ISO-NE SCC			16.404			10,715.9				

Sources: 4587-NGrid-LTCRER-2016_11-12-15.pdf and scc_december_2015_v2.xls

Exhibit II

NGRID Response to DIV 2-6											
DG Projects Currently Connected to NECO Distribution System											
No.	City/Town	Month	Year	KW	Inter- Connection Voltage	Feeder Rating MVA	Study Min Load MVA	Study Max Load MVA	Post Study Min MVA	Post Study Max MVA	Percent Feeder Rating
1	EAST PROVIDENCE	11	2013	3,000	23.00	14.50	2.48	5.20	2.20	8.80	61%
2	NORTH KINGSTOWN	10	2013	2,000	12.47	12.80	4.28	8.30	2.70	7.70	60%
3	WEST GREENWICH	7	2013	1,666	12.47	11.40	2.52	9.19	1.90	7.60	67%
4	NORTH KINGSTOWN	11	2012	1,500	12.47	11.40	1.90	7.60	2.74	6.70	59%
5	JOHNSTON	6	2015	1,375	12.47	11.10	2.30	9.30	2.40	6.80	61%
6	PROVIDENCE	3	2014	1,225	23.00	26.50	2.24	5.70	2.00	8.10	31%
7	WOONSOCKET	11	2009	1,200	13.80	12.30	Unk	Unk	0.31	2.76	22%
8	NORTH SMITHFIELD	11	2014	850	13.80	12.30	2.65	7.45	2.14	6.13	50%
9	PORTSMOUTH	5	2013	500	13.80	11.10	2.04	6.89	2.60	5.90	53%
10	CUMBERLAND	3	2014	500	13.80	7.80	2.27	6.61	2.20	5.60	72%
11	WYOMING	2	2015	499	12.47	11.10	2.86	6.11	2.60	5.80	52%
12	CUMBERLAND	3	2014	450	13.80	12.30	2.85	11.17	2.60	9.20	75%
13	MIDDLETOWN	7	2013	405	4.16	3.50	0.81	3.21	0.70	2.80	80%
14	CUMBERLAND	7	2013	400	13.80	12.00	1.30	5.60	1.50	4.90	41%
15	PROVIDENCE	3	2014	320	23.00	26.50	2.24	5.70	2.00	8.10	31%
16	CRANSTON	3	2014	300	12.47	9.90	0.90	3.90	0.09	3.20	32%
17	TIVERTON	6	2012	275	0.48	9.80	4.70	8.60	2.90	5.50	56%
18	NORTH KINGSTOWN	9	2014	250	12.47	12.80	3.34	6.13	2.70	7.70	60%
19	WEST WARWICK	2	2014	135	12.47	9.70	2.08	8.30	3.20	6.50	67%
20	WOONSOCKET	12	2014	128	0.48	12.40	2.00	7.90	3.40	9.40	76%
21	CHEPACHET	1	2015	72	0.48	8.90	1.60	6.20	1.68	5.60	63%
22	ESMOND	10	2014	56	0.48	11.40	2.50	9.80	2.73	9.10	80%
23	MIDDLETOWN	12	2014	50	0.48	13.30	4.30	10.10	2.50	10.00	75%
17,156											

Exhibit III

NGRID Response to PUC 1-18 DG Projects To Be Connected to NECO Distribution System by September 2017								
No.	Unit Identifier	Type	Primary (P) or Secondary (S) Access			Nameplate Availability times		Calculated Annual Access Fee
			Nameplate kW	Availability Factor	times	Availability	Fee per KW	
1	11	Solar	3,000	P	40%	1,200	\$5.00	\$72,000
2	6	Solar	2,000	P	40%	800	\$5.00	\$48,000
3	10	Solar	2,000	P	40%	800	\$5.00	\$48,000
4	13	Solar	1,833	P	40%	733	\$5.00	\$43,992
5	2	Hydro	1,800	S	10%	180	\$7.50	\$16,200
6	5	Wind	1,500	P	30%	450	\$5.00	\$27,000
7	43	Wind	1,500	P	30%	450	\$5.00	\$27,000
8	44	Wind	1,500	P	30%	450	\$5.00	\$27,000
9	25	Solar	1,375	P	40%	550	\$5.00	\$33,000
10	27	Solar	1,298	P	40%	519	\$5.00	\$31,152
11	33	Solar	1,250	P	40%	500	\$5.00	\$30,000
12	34	Solar	1,250	P	40%	500	\$5.00	\$30,000
13	30	Solar	1,246	P	40%	498	\$5.00	\$29,904
14	35	Solar	1,246	P	40%	498	\$5.00	\$29,904
15	36	Solar	1,242	P	40%	497	\$5.00	\$29,808
16	1	Hydro	1,200	P	10%	120	\$5.00	\$7,200
17	3	Hydro	1,200	P	10%	120	\$5.00	\$7,200
18	37	Solar	1,043	P	40%	417	\$5.00	\$25,032
19	31	Solar	895	P	40%	358	\$5.00	\$21,480
20	19	Solar	850	P	40%	340	\$5.00	\$20,400
21	32	Anaerobic Digestion	500	P	40%	200	\$5.00	\$12,000
22	7	Solar	500	P	40%	200	\$5.00	\$12,000
23	8	Solar	500	P	40%	200	\$5.00	\$12,000
24	9	Solar	500	P	40%	200	\$5.00	\$12,000
25	15	Solar	500	P	40%	200	\$5.00	\$12,000
26	16	Solar	500	P	40%	200	\$5.00	\$12,000
27	26	Solar	500	P	40%	200	\$5.00	\$12,000
28	38	Solar	500	P	40%	200	\$5.00	\$12,000
29	39	Solar	500	P	40%	200	\$5.00	\$12,000
30	24	Solar	499	P	40%	200	\$5.00	\$11,976
31	40	Solar	499	P	40%	200	\$5.00	\$11,976
32	28	Solar	498	P	40%	199	\$5.00	\$11,952
33	14	Solar	320	S	40%	128	\$7.50	\$11,520
34	17	Solar	300	P	40%	120	\$5.00	\$7,200
35	18	Solar	300	S	40%	120	\$7.50	\$10,800
36	4	Wind	275	S	30%	83	\$7.50	\$7,425
37	41	Solar	270	S	40%	108	\$7.50	\$9,720
38	42	Solar	173	S	40%	69	\$7.50	\$6,228
39	12	Solar	135	S	40%	54	\$7.50	\$4,860
40	20	Solar	128	S	40%	51	\$7.50	\$4,608
41	29	Solar	110	S	40%	44	\$7.50	\$3,960
42	23	Solar	72	S	40%	29	\$7.50	\$2,592
43	22	Solar	56	S	40%	22	\$7.50	\$2,016
44	21	Solar	50	S	40%	20	\$7.50	\$1,800
			37,413			13,228		\$820,905

Exhibit IV
Resume of Richard S. Hahn

Richard S. Hahn

Principal Consultant

SUMMARY

Mr. Hahn is a senior executive in the energy industry, with diverse experience in both regulated and unregulated companies. He joined La Capra Associates in 2004. Mr. Hahn has a proven track record of analyzing energy, capacity, and ancillary services markets, valuation of energy assets, developing and reviewing integrated resource plans, procurement of power supplies and portfolio management, transmission planning, rates, financial analysis, mergers and acquisitions, creating operational excellence, managing full P&Ls, and developing start-ups. He has demonstrated expertise in electricity markets, utility planning and operations, sales and marketing, engineering, business development, and R&D. Mr. Hahn has testified on numerous occasions before state utility commissions, and has also testified before FERC.

DETAILED CHRONOLOGY – DAYMARK ENERGY ADVISORS, INC.

- Daymark Energy Advisors was retained by the Wisconsin Citizens Utility Board to evaluate the application Wisconsin Power & Light for a Certificate of Public Convenience and Necessity to construct a 650 MW natural gas -fired combined cycle plant. We also reviewed a Purchased Power Agreement that was proposed as an alternative to the new plant.
- Reviewed a purchased power agreement between National Grid and Copenhagen Wind for the Rhode Island Division of Public Utilities and Carriers
- Performed an audit of Rocky Mountain Power Company's 2014 Energy Balancing Account, including a review of the Company's hedging program.
- Reviewed National Grid's 2016 Standard Offer Supply ("SOS") and Renewable Energy Standard ("RES") Procurement Plans
- In 2014 and 2015, Daymark Energy Advisors was retained by the Wisconsin Citizens Utility Board (WI CUB) to evaluate the application American Transmission Company ("ATC") for a Certificate of Public Convenience and Necessity (CPCN) to construct a 345 kV and a 230 KV transmission line from eastern Wisconsin to the Upper Peninsula of Michigan.
- Daymark Energy Advisors was retained by the Citizens Utility Board of Wisconsin (WI CUB) to evaluate the proposed merger between WEC and Integrys. Our assignment was to review the transaction and determine whether it complied with the Wisconsin merger standard, and if not, to develop implementable actions to ensure compliance.
- Maine Public Utilities Commission ("MPUC") retained Daymark Energy Advisors to evaluate possible non-transmission alternatives ("NTAs") to a proposed transmission substation and other ancillary transmission upgrades in the Lakes Region. This transmission project is proposed by Central Maine Power Company ("CMP"). CMP has filed for a Certificate of Public Convenience and Necessity ("CPCN") for the proposed transmission enhancements and its filing states that this project is needed to resolve reliability concerns. Daymark Energy Advisors performed an independent reliability assessment and developed Alternative Resource Configurations ("ARCs") that could serve as NTAs and adequately

address the reliability issues over the 2015 to 2030 planning horizon for this project. Daymark Energy Advisors also performed a life-cycle economic analysis of the ARCs versus the transmission project.

- Maine Public Utilities Commission (“MPUC”) retained Daymark Energy Advisors to evaluate possible non-transmission alternatives (“NTAs”) to a proposed transmission substation and other ancillary transmission upgrades in the Waterville-Winslow Region. This transmission project is proposed by Central Maine Power Company (“CMP”). CMP has filed for a Certificate of Public Convenience and Necessity (“CPCN”) for the proposed transmission enhancements and its filing states that this project is needed to resolve reliability concerns. Daymark Energy Advisors performed an independent reliability assessment and developed Alternative Resource Configurations (“ARCs”) that could serve as NTAs and adequately address the reliability issues over the 2015 to 2030 planning horizon for this project. Daymark Energy Advisors also performed a life-cycle economic analysis of the ARCs versus the transmission project.
- Reviewed and analyzed a proposed pilot program to implement a new street lighting program in Rhode Island that included metered, directly controlled LED street lights
- Reviewed and analyzed a risk assessment model prepared by Black and Veatch for Duke Energy Indiana, which was utilized to identify investments for the replacement of Transmission and Distribution (“T&D”) infrastructure for its Transmission, Distribution, and Storage System Improvement Charges 7-year plan (“T & D Plan”)
- Reviewed the Application of Rocky Mountain Power seeking approval from the Public Service Commission of Utah to increase electric rates. The scope of the assignment was to review the proposed additions to plant in-service
- Performed an audit of Rocky Mountain Power Company's 2013 Energy Balancing Account, including a review of the Company's hedging program.
- Performed an asset valuation to estimate the market value of all power plants owned by Public Service of New Hampshire. Presented results to the New Hampshire Public Utilities
- Reviewed a proposed Default Service Procurement Plan for PECO Energy for 2015-2017
- Reviewed a proposed Default Service Procurement Plan for PPL Electric Utilities for 2015-2017
- Reviewed a request by Wisconsin Public Service to increase retail rates.
- Reviewed and analyzed a proposed tariff and related documents for Rhode Island to acquire street lighting assets owned by NGRID. Presented findings to the Rhode Island Public utilities Commission.
- Analyzed a proposed interconnection of a 30mw off-shore wind project to the ISO New England grid. Presented findings to the Rhode Island Public Utilities Commission
- Reviewed NGRID's 2014 Electric Retail Rate Filing requesting Commission approval of various charges and adjustment factors as well as NGRID's 2014 RES Charge and Reconciliation filing.
- Reviewed proposed TOU rates by PPL Electric on behalf of the Pennsylvania Office of Consumer Advocate
- Performed an analysis of a proposal to convert the Valley Power Plant in Milwaukee to switch from coal to natural gas; included a reliability assessment of the need for the plant to maintain local reliability
- Reviewed the adequacy of the supply of renewable energy certificates for 2015 and 2016 for impact on the Rhode Island Renewable Energy Standard

- Reviewed a purchased power agreement between National Grid and Champlain / Bowers Wind for the Rhode Island Division of Public Utilities and Carriers
- Daymark Energy Advisors was retained by the Nova Scotia Small Business Advocate to review and analyze the 2013 Annual Capital Expenditure (“ACE”) Plan for Nova Scotia Power Incorporated (“the Company” or “NSPI”). I served as a key member of the team responsible for reviewed transmission projects.
- Served as an advisor to the Belmont Municipal Light Department in its efforts to upgrade its transmission interconnection to 115KV
- Performed an assessment of the proposed merger of Peoples Natural Gas and Equitable Gas Company for the Pennsylvania Office of Consumer Advocate.
- Reviewed the proposed default service procurement of UGI Utilities to procure standard offer service power supplies for its non-shopping customers for 2014 to 2017.
- Performed an audit of Rocky Mountain Power's 2012 Energy Balancing Account, including a review of the Company's hedging program.
- Reviewed a request by Wisconsin Public Service to implement the System Modernization and Reliability Project, a large-scale capital program to improve system reliability in Northern Wisconsin
- Served as a member of a Daymark Energy Advisors team advising the Arkansas Public Service Commission Staff regarding Entergy's Application to transfer ownership of transmission assets to ITC
- Reviewed and analyzed NGRID proposed 2013 LTCRER factor; provided written comments to RI PUC
- Reviewed Rocky Mountain Power Company's Energy Balancing Account filing for 2011; filed testimony before the Utah PSC
- Reviewed NGRID proposed tariff revisions for recovery of Long-Term Renewable Energy Contracts; provided written comments to RI PUC
- Analyzed proposed environmental upgrades to the Flint Creek coal unit in Arkansas; filed written testimony before the Arkansas PSC
- WI CUB WEPCO 2013 Rate Case; review prudence of capital and fuel costs; filed written testimony before the Wisconsin PSC
- Reviewed and analyzed a request for an Advanced Determination of Prudence for a new wind generation facility; filed written testimony before the North Dakota PSC
- Reviewed proposed 2013 -2015 Default Service Procurement Plan for PPL Utilities; filed written testimony before the Pennsylvania PUC.
- Analyzed forecast of projected capital additions to plant in service for forward-looking test year in Utah rate case. Filed testimony before the Utah Public Service Commission.
- Review and analysis of National Grid's proposed 2013 Standard Offer Service and Renewable Energy Standard procurement plan on behalf of the Rhode Island Division of Public utilities and Carriers.
- Review and analysis of National Grid's proposed long term renewable contracting plan on behalf of the Rhode Island Division of Public utilities and Carriers.
- Review and analysis of a long-term renewable energy contract between Black Bear Hydro and National Grid on behalf of the Rhode Island Division of Public Utilities and Carriers.

- Reviewed proposed 2013 -2015 Default Service Procurement Plan for PECO Energy on behalf of the Pennsylvania Office of Consumer Advocate
- Review National Grid's 2012 Electric Retail Rate Filing requesting Commission approval of various charges and adjustment factors for the Rhode Island Division of Public Utilities and Carriers
- Analyzed the request to the Wisconsin Public Service Commission for a CPCN for the Hampton - Rochester - La Crosse Baseline Reliability Project
- Performed an assessment of the TOU rates proposed by PPL Electric Utilities before the Pennsylvania Public Utilities Commission; Presented expert testimony providing the results of that assessment
- Reviewed the proposed merger between Exelon and Constellation Energy for its impact on market power; filed testimony before the Pennsylvania Public Utilities Commission
- Reviewed the proposed merger between Exelon and Constellation Energy for its impact on market power; filed testimony before the Federal Energy Regulatory Commission and the Maryland Public Service Commission
- Conducted an assessment of the request to the North Dakota Public Service Commission for an Advanced Determination of Prudence for the Montana Dakota Utilities GT; filed testimony before the North Dakota Public Service Commission
- Conducted an assessment of the request to the North Dakota Public Service Commission for an Advanced Determination of Prudence for the Big Stone Air Quality Control System; filed testimony before the North Dakota Public Service Commission
- Analyzed proposed 2012 monitored and non-monitored fuel costs, market sales and revenues, capacity position, and performance parameters for Wisconsin Electric Power; filed testimony before the Public Service Commission of Wisconsin
- Analyzed proposed ceiling prices for Distributed Generation procurement for the Rhode Island Division of Public Utilities and Carriers in Docket 4288
- Reviewed proposed changes to National Grid's Distributed Generation Enrollment Process for the Rhode Island Division of Public Utilities and Carriers in Docket 4276
- Reviewed proposed changes to National Grid's interconnections standards for the Rhode Island Division of Public Utilities and Carriers in Docket 4277
- Analyzed proposed 2012 monitored and non-monitored fuel costs, market sales and revenues, capacity position, and performance parameters for Northern States Power Wisconsin; filed testimony before the Public Service Commission of Wisconsin
- Analyzed proposed 2012 monitored and non-monitored fuel costs, market sales and revenues, capacity position, and performance parameters for Madison Gas & Electric; filed testimony before the Public Service Commission of Wisconsin
- Analyzed proposed 2012 monitored and non-monitored fuel costs, market sales and revenues, capacity position, and performance parameters for Wisconsin Public Service; filed testimony before the Public Service Commission of Wisconsin
- Reviewed the proposed merger between Duke Energy and Progress Energy for compliance with merger approval standards and the impact of the merger on customers; filed testimony before the North Carolina Public Utilities Commission and the South Carolina Public Service Commission

- Analyzed the De-List Bid submitted by Vermont Yankee in ISO-NE capacity auctions. Filed statement at FERC presenting the results of that assessment.
- Performed an assessment of a proposal by Nova Scotia Power to increase spending on vegetation management activities as part of the 2012 rate case; filed testimony before the Nova Scotia Utility and Review Board
- Reviewed and analyzed a proposed Purchased Power Agreement between National Grid and Orbit Energy; filed testimony before the Rhode Island Public Utility Commission in Docket 4265
- Conducted a study of non-transmission alternatives to a proposed substation and related transmission upgrades in Ascutney Vermont
- Reviewed and analyzed NGRID proposed SOS procurement plan and RES Compliance plan for 2012; provided testimony before the Rhode Island Public Utility Commission in Docket 4227
- Conducted a study of non-transmission alternatives to a proposed substation and related transmission upgrades in Bennington Vermont
- Prepared follow-on analysis of Utah resource acquisition in rate case in Docket 10-035-124
- Reviewed and analyzed a proposed retail rate increase by Fitchburg Gas and Electric Company before the Massachusetts Department of Public Utilities. Provided expert testimony before the Massachusetts Department of Public Utilities regarding the Company's proposed Capital Spending Plan, and an accompanying recovery mechanism
- Conducted a study of non-transmission alternatives to a proposed substation and related transmission upgrades in Georgia, Vermont
- Reviewed and analyzed damages claimed in litigation between a developer of renewable energy facilities and the owner of the host site
- Evaluated the decision of PacifiCorp to acquire new generating resources in Utah. Filed testimony before the Public Service Commission of Utah
- Served as a principal advisor and key team member in Daymark Energy Advisors' assessment of strategic options for Entergy Arkansas, Inc. subsequent to its withdrawal from the Entergy System Agreement
- Reviewed the issues and documentation related to a complaint regarding the net metering issues for the Portsmouth Wind Turbine for the Rhode Island Divisions of Public Utilities and Carriers
- Conducted a study of non-transmission alternatives to a proposed substation and related transmission upgrades in Jay, Vermont
- Reviewed and evaluated the construction and cost recovery of a large cogeneration plant for a mid-west utility; utilized heat balance analysis to develop new cost allocators between steam and electric sales.
- Analyzed fuel costs, market sales and revenues, capacity position, and performance parameters for a large- mid-west utility.
- Performed a review and analysis of the proposed merger between FirstEnergy and Allegheny Energy. Provided expert testimony before the FERC and the Pennsylvania Public Utilities Commission regarding merger policy, benefits and market power issues.

- Performed a study of non-transmission alternatives to a proposed transmission project in the Lewiston-Auburn area of Central Maine Power Company's service territory. Testified before the Maine Public Utilities Commission.
- Analyzed a proposed plan by National Grid to procure 2011 default service power supplies and comply with Renewable Energy Standards. Provided expert testimony before the Rhode Island Public Utilities Commission in Docket 4149.
- Served as an advisor to the Pennsylvania Office of Consumer Advocate in reviewing 2011 default service plans for PECO Energy
- Served as an advisor to the Pennsylvania Office of Consumer Advocate in reviewing 2011 default service plans for PPL Electric Utilities.
- Analyzed a purchase power agreement between National Grid and on offshore wind project in Rhode Island. Provided expert testimony before the Rhode Island Public Utilities Commission.
- Reviewed and analyzed a proposed retail rate increase by Western Massachusetts Electric Company before the Massachusetts Department of Public Utilities. Provided expert testimony before the Massachusetts Department of Public Utilities regarding the Company's proposed Capital Plan, and an accompanying recovery mechanism.
- Served as an advisor to the developer of a utility-scale Solar PV facility in Massachusetts.
- Evaluated a proposed Solar PV installation for a large retail customer in Massachusetts. Performed an analysis of the appropriate rate of return and its impact on facility electric costs and financial feasibility.
- Assessed the economic impact of an additional interconnection between ISO-NE and NYISO; analyzed impact on market prices and congestion.
- Reviewed and analyzed the capacity position of a large mid-west utility and the impact of that position on electric rates.
- Performed an economic evaluation of a proposed transmission line in New England. Assessed the project's ability to deliver renewable energy to load centers and the impact of the project on Locational Marginal Prices.
- Analyzed a proposed interconnection of a large new industrial load in Massachusetts. Evaluated proposed substation configuration and developed alternatives that achieved comparable reliability at lower costs. Assessed cost recovery options.
- Reviewed the Energy Efficiency and Conservation Programs proposed by Pennsylvania Power & Light in response to Act 129, Pennsylvania legislation that requires Electric Distribution Companies to achieve certain annual consumptions and demand reduction by 2013. Provided expert testimony before the Pennsylvania Public Utilities Commission regarding program design, benefit cost analyses, and cost recovery.
- Reviewed the Energy Efficiency and Conservation Programs proposed by Philadelphia Electric Company in response to Act 129, Pennsylvania legislation that requires Electric Distribution Companies to achieve certain annual consumptions and demand reduction by 2013. Provided expert testimony before the Pennsylvania Public Utilities Commission regarding program design, benefit cost analyses, and cost recovery.
- Assisted in the review and analysis of a proposed retail rate increase by National Grid before the Rhode Island Public Utilities Commission. Provided expert testimony before the Rhode Island Public Utilities

Commission regarding the Company's proposed Inspection & Maintenance Program, its Capital Plan, its Storm Funding Plan, and its Facilities Plan

- Reviewed and analyzed Time-of-Use rates proposed by Pennsylvania Power & Light. Provided expert testimony before the Pennsylvania Public Utilities Commission regarding compliance with Commission requirements, rate design, cost recovery, and consumer education issues.
- Assisted in the review and analysis of a proposed retail rate increase by National Grid before the Massachusetts Department of Public Utilities. Provided expert testimony before the Massachusetts Department of Public Utilities regarding the Company's proposed Inspection & Maintenance Program, its Capital Plan, its Storm Funding Plan, and its Facilities Plan.
- Performed a review and analysis of the proposed merger between Exelon and NRG. Provided expert testimony before the Pennsylvania Public Utilities Commission regarding merger policy, benefits and market power issues.
- Reviewed the needs analysis and load forecast supporting a proposed Transmission Project in Rhode Island. Provided expert testimony before the Rhode Island Public Utilities Commission.
- Performed an assessment of plans to procure Default Service Power Supplies for a Rhode Island utility. Provided expert testimony before the Rhode Island Public Utilities Commission.
- Served as an advisor to Vermont electric utilities regarding the evaluation of new power supply alternatives. Developed and applied a probabilistic planning tool to model uncertainty in costs and operating parameters.
- Conducted a review of Massachusetts Electric Company's proposal to construct, own, and operate large scale PV solar generating units. Served as an advisor to the Massachusetts Attorney General in settlement negotiations. Performed an analysis of the appropriate rate of return and its impact on ratepayer costs and financial feasibility. Provided expert testimony before the Massachusetts Department of Public Utilities.
- Conducted a review of Western Massachusetts Electric Company's proposal to construct, own, and operate large scale PV solar generating units. Served as an advisor to the Massachusetts Attorney General in settlement negotiations. Performed an analysis of the appropriate rate of return and its impact on ratepayer costs and financial feasibility. Provided expert testimony before the Massachusetts Department of Public Utilities.
- Served as a key member of a Daymark Energy Advisors Team evaluating wind generation RFPs in Oklahoma.
- Performed an assessment of plans to procure Default Service Power Supplies for Pennsylvania utilities. Provided expert testimony before the Pennsylvania Public Utilities Commission.
- Performed an assessment of a merchant generator proposal to construct, own, and operate 800 MW of large scale PV solar generating units in Maine.
- Analyzed proposed environmental upgrades to the Edgewater 5 coal-fired generating unit in Wisconsin, including an economic evaluation of this investment compared to alternative supply resources. Provided expert testimony before the Public Service Commission of Wisconsin.
- Analyzed proposed environmental upgrades to the Columbia Energy Center coal-fired generating units in Wisconsin, including an economic evaluation of this investment compared to alternative supply resources. Provided expert testimony before the Public Service Commission of Wisconsin.

- Analyzed proposed environmental upgrades to the Oak Creek coal-fired generating units in Wisconsin, including an economic evaluation of this investment compared to alternative supply resources. Provided expert testimony before the Public Service Commission of Wisconsin.
- Reviewed Pennsylvania Act 129 and Commission rules for Energy Efficiency Plans
- Performed a study of non-transmission alternatives (NTAs) to a proposed set of transmission upgrades to the bulk power supply system in Maine.
- Served as a key member of the Daymark Energy Advisors Team advising the Connecticut Energy Advisory Board (CEAB) on a wide range of energy issues, including integrated resources plan and the need for and alternatives to new transmission projects.
- Performed a study of non-transmission alternatives (NTAs) to a proposed set of transmission upgrades to the bulk power supply system in Vermont.
- Served as an advisor to the Delaware Public Service Commission and three other state agencies in the review of Delmarva Power & Light's integrated resource plan and the procurement of power supplies to meet SOS obligations.
- Served as an expert witness in litigation involving a contract dispute between the owner of a merchant power plant and the purchasers of the output of the plant.
- Served as an advisor to the Maryland Attorney General's Office in the proposed merger between Constellation Energy and the FPL Group.
- Reviewed and analyzed outages for Connecticut utilities during the August 2006 heat wave. Prepared an assessment of utility filed reports and corrective actions.
- Conducted a study of required planning data and prepared forecasts of the key drivers of future power supply costs for public power systems in New England.
- Reviewed and analyzed Hawaiian Electric Company integrated resource plan and its DSM programs for the State of Hawaii. Prepared written statement of position and testified in panel discussions before the Hawaii Public Utility Commission.
- Assisted the Town of Hingham, MA in reviewing alternatives to improve wireless coverage within the Town and to leverage existing telecommunication assets of the Hingham Municipal Light Plant.
- Conducted an extensive study of distributed generation technologies, options, costs, and performance parameters for VELCO and CVPS.
- Analyzed and evaluated proposals for three substations in Connecticut. Prepared and issued RFPs to seek alternatives in accordance with state law.
- Performed an assessment of merger savings from the First Energy – GPU merger. Developed a rate mechanism to deliver the ratepayers share of those savings. Filed testimony before the PA PUC.
- Prepared long term price forecasts for energy and capacity in the ISO-NE control area for evaluating the acquisition of existing power plants.
- Conducted an assessment of market power in PJM electricity markets as a result of the proposed merger between Exelon and PSEG. Developed a mitigation plan to alleviate potential exercise of market power. Filed testimony before the PA PUC.
- Performed a long-term locational installed capacity (LICAP) price forecast for the NYC zone of the NYISO control area for generating asset acquisition.

- Served as an Independent Evaluator of a purchase power agreement between a large mid-west utility and a very large cogeneration plant. Evaluated the implementation of amendments to the purchase power agreement, and audited compliance with very complex contract terms and operating procedures and practices.
- Performed asset valuation for energy investors targeting acquisition of major electric generating facility in New England. Prepared forecast of market prices for capacity and energy products. Presented overview of the market rules and operation of ISO-NE to investors.
- Assisted in the performance of an asset valuation of major fleet of coal-fired electric generating plants in New York. Prepared forecast of market prices for capacity and energy products. Analyzed cost and operations impacts of major environmental legislation and the effects on market prices and asset valuations.
- Conducted an analysis of the cost impact of two undersea electric cable outages within the NYISO control area for litigation support. Reviewed claims of cost impacts from loss of sales of transmission congestion contracts and replacement power costs.
- Reviewed technical studies of the operational and system impacts of major electric transmission upgrades in the state of Connecticut. Analysis including an assessment of harmonic resonance and type of cable construction to be deployed.
- Conducted a review of amendments to a purchased power agreement between an independent merchant generator and the host utility. Assessed the economic and reliability impacts and all contract terms for reasonableness.
- Assisted in the development of an energy strategy for a large Midwest manufacturing facility with on-site generation. Reviewed electric restructuring rules, electric rate availability, purchase & sale options, and operational capability to determine the least cost approach to maximizing the value of the on-site generation.
- Assisted in the review of the impact of a major transmission upgrade in Northern New England.
- Negotiated a new interconnection agreement for a large hotel in Northeastern Massachusetts.

SELECTED EXPERIENCE – NSTAR ELECTRIC & GAS

President & COO of NSTAR Unregulated Subsidiaries

Concurrently served as President and COO of three unregulated NSTAR subsidiaries: Advanced Energy Systems, Inc., NSTAR Steam Corporation, and NSTAR Communications, Inc.

Advanced Energy Systems, Inc.

Responsible for all aspects of this unregulated business, a large merchant cogeneration facility in Eastern Massachusetts that sold electricity, steam, and chilled water. Duties included management, operations, finance and accounting, sales, and P&L responsibility.

NSTAR Steam Corporation

Responsible for all aspects of this unregulated business, a district energy system in Eastern Massachusetts that sold steam for heating, cooling, and process loads. Duties included management, operations, finance and accounting, sales, and P&L responsibility.

NSTAR Communications, Inc.

Responsible for all aspects of this unregulated business, a start-up provider of telecommunications services in Eastern Massachusetts. Duties included management, operations, finance and accounting, sales, and P&L responsibility.

Established a joint venture with RCN to deliver a bundled package of voice, video, and data services to residential and business customers. Negotiated complex indefeasible-right-to-use and stock conversion agreements.

Installed 2,800 miles of network in three years. Built capacity for 230,000 residential and 500 major enterprise customers.

Testified before the Congress of the United States on increasing competition under the Telecommunications Act of 1996.

VP, Technology, Research, & Development, Boston Edison Company

Responsible for identifying, evaluating, and deploying technological innovation at every level of the business.

Reviewed Electric Power Research Institute (EPRI), national laboratories, vendor, and manufacturer R&D sources. Assessed state-of-the-art electro-technologies, from nuclear power plant operations to energy conservation.

VP of Marketing, Boston Edison Company

Promoted and sold residential and commercial energy-efficiency products and customer service programs.

Conducted market research to develop an energy-usage profile. Designed a variable time-of-use pricing structure, significantly reducing on-peak utilization for residential and commercial customers.

Designed and marketed energy-efficiency programs.

Established new distribution channels. Negotiated agreements with major contractors, retailers, and state and federal agencies to promote new energy-efficient electro-technologies.

Vice President, Energy Planning, Boston Edison Company

Responsible for energy-usage forecasting, pricing, contract negotiations, and small power and cogeneration activities. Directed fuel and power purchases

Implemented an integrated, least-cost resource planning process. Created Boston Edison's first state-approved long-range plan.

Assessed non-traditional supply sources, developed conservation and load-management programs, and purchased from cogeneration and small power-production plants.

Negotiated and administered over 200 transmission and purchased power contracts.

Represented the company with external agencies. Served on the Power Planning Committee of the New England Power Pool.

Testified before federal and state regulatory agencies.

EMPLOYMENT HISTORY

Daymark Energy Advisors, Inc. (formerly La Capra Associates, Inc.)
Principal Consultant

Boston, MA
2004 – present

Advanced Energy Systems, Inc.
President and COO

Boston, MA
2001-2003

NSTAR Steam Corporation
President and COO

Cambridge, MA
2001-2003

NSTAR Communications, Inc.*President and COO*

1995-2003

Boston Edison Company

Boston, MA

VP, Technology, Research, & Development

1993-1995

VP, Marketing, Boston Edison Company

1991-1993

Vice President, Energy Planning, Boston Edison Company

1987-1991

Manager, Supply & Demand Planning

1984-1987

Manager, Fuel Regulation & Performance

1982-1984

Assistant to Senior Vice President, Fossil Power Plants

1981-1982

Division Head, Information Resources

1978-1981

Senior Engineer, Information Resource Division

1977-1978

Assistant to VP, Steam Operations

1976-1977

Electrical Engineer, Research & Planning Department

1973-1976

Engineering co-op student

1970-1973

EDUCATION**Boston College**

Boston, MA

Masters in Business Administration

1982

Northeastern University

Boston, MA

Masters in Science, Electrical Engineering

1974

Northeastern University

Boston, MA

Bachelors in Science, Electrical Engineering

1973

PROFESSIONAL AFFILIATIONS**Director, La Capra Associates, Inc.**

2005-2015

Elected Commissioner – Reading Municipal Light Board

2005-2012

Director, NSTAR Communications, Inc.

1997-2003

Director, Advanced Energy Systems, Inc.

2001-2003

Director, Neuco, Inc.

2001-2003

Director, United Telecom Council

1999-2003

Head, Business Development Division, United Telecom Council

2000-2003

Registered Professional Electrical Engineer in Massachusetts