Consulting Services to Review Utility Standard Offer Service Electricity Procurement

In Response to RFP Number
STA15129PSCDPLSOSR

Prepared for the State of Delaware Public Service Commission

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Contact:

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LETTER OF TRANSMITTAL

Ms. Pamela Knotts
Regulatory Policy Administrator
State of Delaware Public Service Commission
861 Silver Lake Blvd
Cannon Building, Suite 100
Dover, Delaware 19904

RE: Consulting Services to Review Utility SOS Electricity Supply Procurement RFP

Dear Ms. Knotts:

The State of Delaware Public Service Commission (the Commission) requires rigorous analysis of multiple long term strategies for electricity procurement that will result in cost effective electricity supply at relatively stable prices for residential and small commercial customers of Delmarva Power & Light.

Synapse Energy Economics, Inc. (Synapse) proposes to provide consulting services to: (1.) Assess long term procurement strategies used throughout the country in relation to Delaware; (2.) Provide recommendations to the Commission on options that can lower electricity costs for Delmarva's residential and small commercial customers over the long term; (3.) Review the State's current relevant legislative requirements with a view to simplifying them for enhanced cost-effectiveness; and (4.) Provide stringent, transparent modeling for the various options presented.

Our project team offers:

- **A Proven Track Record of Consulting for the State of Delaware**

  As described in the following proposal, Synapse has been consistently and successfully completing energy-related projects for DE PSC and other Delaware agencies for over 15 years.

- **Demonstrated Knowledge and Expertise in Utility Procurement Practices**

  Our project team has the experience and expertise to help the Commission staff identify the most useful and efficient project approach, and the tools to support that approach. We have senior staff members with in-depth knowledge of competitive energy supply markets and utility power purchasing practices. Some current examples of our work in this area include technical and expert witness services regarding long term procurement plan rulemaking for the California Office of Ratepayer Advocates, analysis of Basic Generation Service procurement for residential and small commercial customers on behalf of the New Jersey Division of Rate Counsel, and

analysis and expert testimony concerning the Exelon-Pepco Merger for the Delaware Department of Natural Resources.

- **A Proven Project Management Approach Focused on:**
    - Providing regular communication to ensure that we are clear about your needs, expectations, and deadlines;
    - Identifying key assumptions, technical methodologies, and deliverable outlines early in the project;
    - Providing transparent and professional, litigation-quality analyses that support your objectives; and
    - Being responsive to changing needs as the project unfolds.

Our team is ready to begin work immediately, and has sufficient time available throughout the project timeframe to conduct the scope of work discussed in this proposal.

As per the RFP instructions, I can confirm that Synapse takes no exceptions to the terms and conditions of the RFP, as indicated in the Exception Form (included as an attachment to this proposal). I can also confirm that no activity related to this proposal contract will take place outside of the United States. Synapse operates out of an office in Cambridge, Massachusetts.

We look forward to the opportunity of assisting DE PSC in this matter.

Sincerely,

Bruce Biewald, Founder and CEO
Synapse Energy Economics, Inc.
(Authorized signatory)

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1. Delaware License(s) and/or Certification

Synapse Energy Economics, Inc. (Synapse) has initiated the process of applying for a State of Delaware business license.

2. Scope of Work & Evaluation Criteria Responses

2.1 Qualifications and Experience

The Commission requires consultants with deep knowledge of long term options for energy procurement, specifically for residential and small commercial utility customers. Synapse has the expertise needed for a thorough analysis of long term procurement options and policies, as well as the professional rigor to complete comprehensive and transparent modeling to support its recommendations.

Synapse Energy Economics is a research and consulting firm specializing in energy, economic, and environmental topics. Since its inception in 1996, Synapse has grown to become a leader in providing rigorous analysis of the electric power sector for public interest and governmental clients.

Synapse's staff of 30 includes experts in energy and environmental economics, resource planning, electricity dispatch and economic modeling, energy efficiency, renewable energy, transmission and distribution, rate design and cost allocation, risk management, cost-benefit analysis, environmental compliance, climate science, and both regulated and competitive electricity and natural gas markets. Several of our senior-level staff members have more than 30 years of experience in the economics, regulation, and deregulation of the electricity and natural gas sectors, and have held positions as regulators, economists, and utility commission and ISO staff.

Services provided by Synapse include economic and technical analyses, regulatory support, research and report writing, policy analysis and development, representation in stakeholder committees, facilitation, trainings, development of analytical tools, and expert witness services. Synapse is committed to the idea that robust, transparent analyses can help to inform better policy and planning decisions. Many of our clients seek out our experience and expertise to help them participate effectively in planning, regulatory, and litigated cases, and other forums for public involvement and decision making.

Synapse's clients include public utility commissions in U.S. states and Canada, offices of consumer advocates, attorneys general, environmental organizations, foundations, governmental associations, public interest groups, and federal clients such as the U.S. Environmental Protection Agency and the Department of Justice. Our work for international clients has included projects for the United Nations

Framework Convention on Climate Change, the Global Environment Facility, and the International Joint Commission, among others.

Principal Associate Max Chang will serve as the Synapse project manager for this work. Mr. Chang has industry-leading expertise in the economic analysis of technologies and policies and is adept at electricity policy modeling.

The key personnel for our team will also include Alice Napoleon, David White, PhD, and Rachel Wilson. Mr. Chang will be the project manager for this work. Ms. Napoleon, Dr. White and Ms. Wilson will provide technical analysis for the scope of work.

Brief bios for each key team member are provided in section 2.6. Resumes can be found in Appendix A.

a. Synapse work for the State of Delaware

Synapse has successfully completed multiple energy and utility related projects for the Commission and other Delaware agencies. Brief descriptions of these projects are included below.

Exelon Corporation and Pepco Holdings Incorporated Merger
Client: Delaware Natural Resources and Environmental Control

On behalf of the Delaware Natural Resources and Environmental Control, Synapse has submitted testimony regarding renewable, nuclear decommissioning, and market competition matter. Exelon Corporation is seeking Delaware Public Service Commission approval to acquire Pepco Holdings Inc. in a cash transaction worth $6.8 billion. Project Ongoing.

Delmarva Power 2010 IRP Analysis
Client: Delaware Public Service Commission

On behalf of the Delaware Public Service Commission, Synapse evaluated Delmarva Power and Light Company's 2010 Integrated Resource Plan (IRP). Synapse had previously developed detailed comments on Delmarva's 2006 and 2008 IRP filings. For this project, Synapse focused on the following key areas of interest: compliance with the January 1, 2010 IRP regulations; the role of demand-side resources in meeting standard offer service (SOS) customer needs; the choice of resource portfolio used to meet SOS needs; and the options for development of gas-fired generation to meet a portion of SOS supply requirements. Project completed in 2013.

Review and Analysis of Delmarva Power Integrated Resource Plan
Client: Delaware Public Service Commission

Synapse evaluated the Integrated Resource Plan filing of Delmarva Power and Light. Synapse reviewed the way in which the plan complied or did not comply with state directives on integrated resource planning and provision of default service supply. Synapse also provided advice to the Commission on related issues with Delaware's RFP for new generation to be long-term contracted with Delmarva. The first phase of the project was completed in 2009, and a second phase was completed in 2010. Project completed in March 2010.

Executive Order Energy Policy Study
Client: Delaware Public Service Commission

Synapse provided research and consulting support to PSC Staff in the preparation of an energy policy study mandated by an Executive Order of the Governor. Project completed in April 2006. The related publication - *Ensuring Delaware's Energy Future: A Response to Executive Order Number 82* – can be found at www.synapse-energy.com.

Default Service Procurement for Delaware
Client: Delaware Public Service Commission

Synapse advised Public Service Commission Staff in Delaware on alternatives for procuring power to serve default customers as provided for in the State's restructuring law and assisted the PSC Staff in the conduct of a multi-party workshop process considering those alternatives. Synapse examined issues of acquisition of generation supply and the management of a resource portfolio to provide bundled generation service to residential, commercial, and industrial customers and assisted staff in successful multi-party settlement negotiations. Project completed in September 2005. In 2006, Synapse followed up by leading a process to improve the transparency and efficiency of Default Service Procurement.

b. References

Business references are included as Attachment 5.

2.2 Capabilities and Professionalism

Synapse places a strong emphasis on project management practices. We believe it is essential to:

- **Communicate regularly** throughout the project. Mr. Chang will provide Commission staff with project status updates on a monthly basis and more frequent telephone conversations on an as needed basis.
- **Identify key assumptions, technical methodologies, and deliverable outlines** early in the project, to the extent possible. Synapse proposes to work with Commission staff to determine a process and a schedule for approving these critical components as part of the project kickoff meeting.
- **Thoroughly review our work.** Synapse uses an internal peer-review system to ensure that our analyses are highly defensible in litigated cases and public forums. We also make a point of hitting interim deadlines so that our clients have sufficient time to review and provide feedback on work products. We ask our clients to consolidate their edits into one document to streamline the feedback process and avoid opportunities for confusion.
- **Be flexible and responsive to changes** as they arise. We understand that the scope, timing, and/or the nature of deliverables often evolve throughout the course of a

project, for a variety of reasons. With your approval, we will adapt our approach to meet the changing needs of your project.

Synapse has extensive experience providing expert services to support our clients' involvement in procurement planning. The following project descriptions represent a sample of our ongoing and recent work that is related to the Commission's current need:

Analysis of Exelon-Pepco Merger in Delaware
Client: Delaware Department of Natural Resources

Synapse is providing expert technical consulting services to the Delaware Department of Natural Resources and Environmental Control (DNREC) related to Exelon Corporation's proposed acquisition of Pepco Holdings Incorporated. Specifically, Synapse reviewed the value of the benefits and commitments of the merger and concerns regarding concentration of ownership, market power, and market manipulation in the wholesale electricity market. Synapse is submitting testimony in the legal proceeding on behalf of DNREC. Synapse performed similar analysis related to the merger on behalf of clients in Maryland, New Jersey, and the District of Columbia. Project ongoing.

Long Term Procurement Plan Rulemaking
Client: California Office of Ratepayer Advocates

Synapse is providing technical and expert witness services to the California Office of Ratepayer Advocates in connection with the Long Term Procurement Plan proceeding affecting the three largest investor-owned utilities in California: Southern California Edison, Pacific Gas and Electric, and San Diego Gas and Electric. As part of this project, Synapse conducted modeling of the California ISO (CAISO) area using PLEXOS to assess loads and emissions throughout California based on various California Public Utilities Commission scenarios. Synapse analyzed model inputs, assumptions, forecast projections, and outputs, and examined alternatives including renewable energy integration and retirement scenarios. Synapse's modeling enabled determination of areas within California that would be capacity constrained. Project ongoing.

Analysis of Basic Generation Service Procurement
Client: New Jersey Division of Rate Counsel

Since 2005, Synapse has provided analysis of New Jersey's Basic Generation Service (BGS) procurement options for the New Jersey Division of Rate Counsel. The BGS procurement process includes annual auctions held by the state for the procurement of fixed-price, basic electric generation service for those residential and small commercial customers who choose not to use a competitive supplier for their electricity needs. Synapse's BGS procurement analysis takes into consideration the BGS auction process and other factors relevant to procurement options for NJ BGS customers. Synapse's analyses include assessment of procurement options in other states; futures markets for electricity, natural gas, and coal; recent auction/RFP results for equivalent services from other states; PJM technical issues affecting BGS procurement considerations; and other relevant issues. Project ongoing.

2.3 Innovative Suggestions for Review and Analysis

As part of the research component to Task 1, Synapse will not only examine states with restructured markets, but also examine foreign examples that may be applicable to Delaware. Utility restructuring has also occurred in Europe, and case studies from Europe may prove illuminating to the questions being asked by the Commission.

2.4 Description of Final Work Product

Per the RFP, Synapse will provide the Commission with a Summary Assessment of long-term procurement programs based on the research and experience of the Synapse Team. Since Tasks 2 and 3 feed from the Task 1 Assessment, Synapse proposes to provide the Commission with additional follow-up summaries and recommendations. The Task 4 Modeling support work will be concurrent with Task 2 and 3 work. Synapse envisions that at the conclusion of the project, the Commission will have the comprehensive analysis needed to evaluate long-term procurement options to meet the Commission's objective of securing electricity supply cost effectively, while maintaining price stability.

2.5 Knowledge of Competitive Energy Supply Procurement

In both vertically integrated and restructured jurisdictions, electric utilities have an obligation to provide reliable service at reasonable rates. One way to achieve this result is to use portfolio management techniques in the design of the generation mix. Various generation procurement processes can be implemented to achieve this mix, including auctions and requests for proposals. Synapse has wide-ranging expertise in energy supply planning and procurement. As noted in Section 2.2, Synapse is currently working on issues surrounding competitive supply in several states.

The project team will draw on previous Synapse work on procurement issues that can be applied to the proposed scope of work. For example in 2008, Synapse completed a study to identify the cost and risk benefits to residential customers in Maryland of alternative strategies for meeting their electricity requirements over a long-term planning period. Using representative investor-owned utility data, the Synapse team modeled a baseline or reference strategy that reflects a continuation of existing supply procurement approach, based solely on short-term contracts, as well as several alternative portfolio strategies, involving contracts of varying length as well as efficiency programs. Synapse evaluated the candidate portfolios and the baseline scenario using an Excel-based power-system model with a Monte Carlo simulation to evaluate the performance of each strategy under a large number of possible future scenarios, and to measure that performance both in terms of expected cost and cost variability across all future scenarios.1

[1] http://www.synapse-energy.com/sites/default/files/SynapseReport.2008-03.MD-OPC.Procurement-Strategies-for-SOS.07-067.pdf

In addition, Synapse's experience and current involvement in integrated resource planning work throughout the country may provide useful parallels to consider in the proposed scope of work. While not competitive markets, proper planning recommendations in regulated states have applicable parallels in the PJM market.

2.6 Staffing Plan and Past Experience

Principal Associate Max Chang will serve as Synapse's project manager for this work. He will be the primary liaison with the Commission for this project, and will be responsible for developing a clear work plan, overseeing the project team, and ensuring that deliverables are provided on schedule and to the satisfaction of the Commission. Our understanding is that Pamela Knotts will serve as the primary point of contact for the Commission for this project.

Mr. Chang led Synapse work on Basic Generation Service analysis for the New Jersey Division of Rate Counsel (described in section 2.2) and serves a crucial role in managing and coauthoring the biennial Avoided Energy Supply Costs in New England study, which is a key reference used by New England energy efficiency program administrators to develop energy efficiency plans based on long-term avoided costs. He also provides technical expertise and files testimony for litigation cases involving the Exelon Pepco merger.

Mr. Chang will be supported in this project by Alice Napoleon, Dr. David E. White and Rachel Wilson.

Synapse's project team is keenly aware of the economic and budget realities that constrain state and local agencies. In recognition of this fact, we have structured our team so that we can provide the substantial experience that this project requires while controlling overall costs.

The combination of senior subject matter experts with analytical staff provides a division of labor that is cost-effective. We anticipate that the senior staff and subject matter experts will work closely with Commission staff to ensure that their needs are fully addressed, and will contribute overall design and implementation oversight, as well as hold primary responsibility for quality control. Project Associates will be responsible for research, analysis, and various implementation tasks, under the supervision of the senior staff. This approach will help to ensure that the Synapse team provides the highest and most efficient level of technical service and the best value.

The core project team will also have access to resources across Synapse. These additional resources include wholesale market modelers, economists, and other technical specialists.

We include brief bios for the project team below. Resumes are included as Appendix A.

Max Chang, Principal Associate

Max Chang provides economic analysis of technologies and policies, performs electricity policy modeling, evaluates distribution system infrastructure, and evaluates air emissions of electricity generation. His projects at Synapse have focused on energy efficiency, consumer advocacy,

environmental compliance, nuclear costs and risks, distribution system investments, and technology strategy within the energy industry.

Mr. Chang has filed expert testimony in Massachusetts and New Jersey regarding energy efficiency plans and program costs, and has presented or testified on a range of issues before the United States District Court, Vermont Public Service Board, and the Maine Public Service Commission. He regularly analyzes reliability metrics and infrastructure issues in utility rates cases, and examines the benefits and costs of energy efficiency measures and programs for the U.S. Environmental Protection Agency and consumer advocate clients.

In 2011 and 2013, Mr. Chang played a central role in managing and coauthoring the biennial *Avoided Energy Supply Costs in New England* study, which is a key reference used by New England energy efficiency program administrators to develop energy efficiency plans. He has also authored several reports examining the costs and risks associated with proposed nuclear power plants and alternatives in the southeastern U.S., including studies examining the Vogtle reactors, and the proposed William States Lee and Levy reactors.

Prior to joining Synapse, Mr. Chang was a senior scientist at Environmental Health and Engineering, and a financial analyst covering real estate investment trusts. He holds a master's degree in environmental health and engineering from the Harvard School of Public Health, and a bachelor of arts from Cornell University.

Alice Napoleon, Senior Associate

Alice Napoleon conducts economic and policy analysis of electric systems and emissions regulations. In the regular course of her work, she researches demographic and economic data, federal and state regulations, and rulemakings and legal precedent; writes reports, discovery questions and responses, and expert testimony; and conducts analysis in support of testimony. Her most recent work has focused on review and development of energy efficiency programs, encompassing program design, administration, budgeting, cost recovery, ratemaking, marketing, and cost-benefit analyses.

In collaboration with the Industrial Energy Analysis group of Lawrence Berkeley National Laboratory, Ms. Napoleon is managing the development of a toolkit for energy efficiency program administrators to incorporate the U.S. Department of Energy's Superior Energy Performance™ (SEP) into their portfolios. For this effort, Ms. Napoleon and her team are developing materials for communicating why program administrators would offer SEP to their industrial customers, guidance on program design (including incentives, outreach, monitoring and verification, and savings attribution), a package of information for regulators, and case studies of existing energy efficiency program offerings that support implementation of strategic energy management.

Since 2009, Ms. Napoleon has provided extensive and ongoing expert analysis and support for the State of New Jersey regarding its state- and utility-administered residential, low income, commercial, and industrial energy efficiency and combined heat and power programs. She regularly reviews, analyzes, and comments on the programs' monthly performance, annual designs and budgets, resource

assessment processes for determining long-term program funding, cost-benefit analyses, overall administrative structure, and other planning processes. She also conducts expert analysis, drafts testimony, and provides litigation support for the state regarding program budgets, performance, marketing, evaluation, cost-benefit analysis, and overlap between utility- and state-administered programs.

Ms. Napoleon also holds expertise in policies targeting air and water emissions, including criteria and hazardous air pollutants, greenhouse gases, and coal combustion wastes. Project work in this area includes facilitating and providing expert analysis for Colorado, South Carolina, and Maryland demand-side resource policy working groups to recommend, develop, and quantify costs and benefits of possible state actions to reduce greenhouse gas emissions. In addition to efficiency- and emissions-related topics, she has provided expert analysis on integrated resource planning, renewable resource policies, risk management policies, Regional Transmission Organization planning processes and markets, power procurement, coal markets, and nuclear power costs and risks.

Ms. Napoleon previously worked at Resource Insight, Inc. where she supported investigations of electric, gas, steam, and water resource issues, primarily in the context of reviews by state utility regulatory commissions. She holds an MA in Public Administration from the University of Massachusetts at Amherst and a BA in Economics from Rutgers University.

David White, PhD, Senior Consultant

David White has analyzed energy systems and been involved with computer modeling since the mid 1970s. His work at Synapse focuses on the technical analysis and modeling of electric system operations and expansion, electricity industry regulation, energy efficiency programs, renewable resource technologies, and clean air regulations and policies.

Dr. White has conducted analyses for well over 100 projects at Synapse, and has contributed to more than 70 publications. As part of this work, he has modeled most of the North American Electric Reliability Council (NERC) regions in the United States and Canada. Dr. White led the modeling efforts for the 2007, 2009, 2011, and 2013 Avoided Energy Supply Costs in New England studies, which is a key reference used by New England energy efficiency program administrators.

Other recent Synapse studies that have benefited from Dr. White's analyses include: State Energy Efficiency Embedded in Annual Energy Outlook Forecasts, prepared for the U.S. Environmental Protection Agency; The Net Benefits of Increased Wind Power in PJM, prepared for the Energy Future Coalition; Findings Regarding the NSPI 2011 Load Forecast, prepared for the Nova Scotia Utility and Review Board; and Potential Impacts of a Renewable and Energy Efficiency Portfolio Standard in Kentucky, prepared for the Mountain Association for Community Economic Development & the Kentucky Sustainable Energy Alliance.

Prior to joining Synapse in 1996, Dr. White was a principal of G-W Associates in Arlington, MA, and before that worked at Energy Systems Research Group (later Tellus Institute). While there, Dr. White

had a lead role in developing many computer modeling systems for energy and environmental analysis. Dr. White also worked for five years at the Massachusetts Institute of Technology Energy Lab.

Dr. White holds a PhD in Engineering Systems from the Massachusetts Institute of Technology, an MS in Physics from Case-Western Reserve University, and a BS in Physics from the University of Akron.

Rachel Wilson, Senior Associate

Rachel Wilson conducts research and assists in writing testimony and publications. Her work focuses on a variety of issues related to electric utilities, including federal and state clean air policy; emissions from electricity generation; environmental compliance technologies, strategies, and costs; integrated resource planning; valuation of environmental externalities from power plants; and the nexus between water and energy.

As part of her work, Ms. Wilson uses optimization and electricity dispatch models, including Strategist, PROMOD, and PROSYM/Market Analytics, to analyze regional energy markets and to evaluate the modeling analyses performed by utilities. She has served as the primary modeling specialist in several recent Synapse projects analyzing proposed retrofits of aging coal-fired power plants, and has testified on related issues before the public utilities commissions of Kentucky and Minnesota.

Since joining Synapse in 2008, Ms. Wilson has contributed to dozens of publications and reports, including: The Potential Rate Effects of Wind Energy and Transmission in the Midwest ISO Region, prepared for the Energy Future Coalition; Comments Regarding MidAmerican Energy Company Filing on Coal-Fired Generation in Iowa, prepared for the Iowa Office of the Consumer Advocate; and Global Best Practices: Strategies for Decarbonizing Electric Power Supply, prepared for the Regulatory Assistance Project.

Prior to joining Synapse, Ms. Wilson worked for an economic and business consulting firm where she focused on issues of energy, the electric industry, and coal production. Ms. Wilson holds a Master of Environmental Management from Yale University and a BA in Environment, Economics, and Politics from Claremont McKenna College.

2.7 Project Plan and Deliverables

The following section details the proposed Synapse project plan for the Tasks identified in the RFP.

2.7.1 Task 1: Electricity Supply Procurement Assessment

Synapse will provide the Commission with an assessment of the benefit/costs/experience of other long-term procurement options for Delaware to consider. Synapse will examine Delaware's current standard offer service compared to other PJM states and New England states. This assessment will include, but not be limited to, the experience of the California Long Term Procurement Process, the Illinois Power Agency, Connecticut's Power Procurement Plan, and an examination of procurement processes in other restructured states. The intent is to cast as wide a net as possible to fully identify possible viable

approaches that might be applied in Delaware. Synapse's proposed key milestones are summarized in Section 2.7.6 below.

Key Meetings & Deliverables

Synapse will propose to hold a kickoff meeting with the Commission within two weeks of award of the contract tentatively scheduled for February 16th in order to outline deliverables, seek additional guidance, and introduce the project team.

As part of the monthly updates, Synapse will provide the Commission with a status of the research process for Task 1.

2.7.2 Task 2: Electricity Supply Procurement Options Recommendation

Based on the initial research findings from Task 1 and with approval from the Commission, Synapse will proceed to develop procurement option recommendations and supporting analyses. The recommendations and analyses will include: 1) recommended features and approaches, 2) evaluation of costs and benefits of the recommended supply procurement program options, and 3) identification and discussion of critical analysis parameters that could impact the recommended procurement program.

The overarching goals of the Task 2 work will ensure that the recommendations allow Delaware to secure electricity supply in a more cost-effective manner, while maintaining appropriate price stability for Delmarva's residential and small commercial customers.

Key Meetings & Deliverables

Synapse anticipates that the key meeting for the Task 2 work will occur approximately 45 days into the project to incorporate research findings and will proceed thereafter concurrently with Task 1 work. Task 2 deliverables will be incorporated into the findings of the Synapse draft report.

2.7.3 Task 3: Review of Legislation and Change Recommendations

Based on the initial kickoff meeting, Synapse will proceed to conduct its initial investigation of legislative requirements that may currently impede long-term procurement options. Following our initial research, Synapse will provide the Commission a memorandum summarizing initial findings. Synapse anticipates that this Task will require more frequent communication to understand legislative and statutory requirements in Delaware.

Key Meetings & Deliverables

Synapse anticipates that the kickoff meeting will provide important guidelines for the Task 3 work that will occur in parallel with Task 1 work. Synapse anticipates that Task 3 work will also require input from Commission Staff, who will have a better understanding of legislative history and statutory requirements. Task 3 deliverables will be incorporated into the findings of the Synapse draft report. In

addition, Task 3 work will resume once Task 2 work has progressed to a point where specific procurement recommendations have been identified.

2.7.4 Task 4: Provide Transparent Modeling to Support Recommendations

Work for Task 4 will occur in parallel with ongoing work in Tasks 1 and 2. Synapse will seek the Commission's input for the range of sensitivities that will be incorporated into the analysis for Tasks 1 and 2. Based on responses to initial questions, Synapse understands that the historical perspective will be for the time period after 2008.

Key Meetings & Deliverables

Task 4 findings and analyses will be incorporated into the draft and final reports that Synapse will provide to the Commission.

2.7.5 Services Not Included in Scope

Numerous additional issues may arise during this project. We are happy to discuss expansion in the scope of work described herein, with corresponding changes in the budget. Note that our proposed scope of work does not include an in-person meeting before the Commission, nor does the proposed scope of work include production cost simulation modeling expenses.

Under Task 3, Synapse shall and will not provide the Commission with a legal interpretation of any proposed recommendations to modify statutory language.

2.7.6 Milestone Schedule

Per the guidance in the RFP, our expected timeline based on the anticipated February 16, 2015 contract award for the project is as follows:

Date	Milestone
Week of March 2nd	Kickoff meeting
Week of March 9th	Memorandum of research areas based on Kickoff Meeting
Week of March 22nd	Initial Task 3 research of existing legislation memorandum
Week of March 30th	Monthly update to Commission
Week of April 13th	Initial Task 1 research findings memorandum
Week of April 20th	Preliminary Task 2 research based on feedback of Task 1 memo and discussion of Task 4 sensitivities
Week of April 27th	Monthly update to Commission
Week of May 4th	Additional findings for Task 1
Week of May 11th	Additional findings for Task 2 and 3 with supporting analyses
Week of May 25th	Initial draft report and Monthly update to Commission
Week of June 22nd	Final report based on feedback on draft report.

Meeting deliverable target dates is contingent upon timely delivery of data/completion of review and comments/etc. from the Commission staff. Our proposed budget for this project assumes one round of comments from the Commission on the draft report. However, Synapse proposes to provide monthly updates on the progress of the project consistent with the table above to elicit regular and timely feedback on the research progress and initial findings.

We request that the Commission immediately advise Synapse as soon as it becomes aware of any developments that may delay completion of scheduled deliverables, including any requested changes to the scope of work requested by the Commission. Synapse will work with the Commission to adjust the deliverable target dates accordingly.

2.8 Conflict of Interest Statement

Synapse believes that we do not have any current conflicts of interest with respect to this contract. However, erring on the side of caution, Synapse advises the Commission of the following information so that Commission Staff may fully assess the potential for conflicts of interest.

Synapse currently is providing technical consulting advice and testimony on behalf of the Delaware Natural Resources and Environmental Control in the Exelon Pepco merger proceeding before the Delaware Public Service Commission.

If awarded this contract, Synapse will consult with the Commission staff before bidding on any future projects related to the substance or stakeholders associated with this contract to ensure that there are no real or perceived conflicts of interest.

2.9 Budget

Our proposed budget for the four tasks associated with this project is $123,580. This is a good faith time-and-materials estimate based upon our current understanding of the requirements to complete the project. However, there are several factors that could impact the level of effort required, including changes in scope, availability of source materials, communication requirements, or other factors. If for any reason we anticipate that the level of effort required will exceed the estimated budget, Synapse will inform the Commission staff as soon as reasonably possible, so that the Commission staff and Synapse can discuss an appropriate modification to the scope and/or budget. In addition, Synapse anticipates that there may be some cost savings since some of the work will be concurrent. However as required by the RFP, Synapse has priced each Task individually.

The hourly billing rates for our project team are as follows: Max Chang $180/hour, Alice Napoleon $170/hour, David White $180/hour, Rachel Wilson $170/hour. The table below presents our estimated labor days and labor cost per task.

Task 1: Electricity Supply Procurement Assessment	Total Costs	Total Days	*$180* Chang	*$190* White	*$170* Napoleon	*$170* Wilson
Review of major active long-term approaches	$11,120	8.0	1	1	3	3
Evaluation of identified program benefits/costs	$6,920	5.0	0.5	0.5	2	2
Identification of best and worst features	$8,400	6.0	1	1	2	2
Preparation of Report (Rough Draft)	$12,560	9.0	2	1	3	3
Preparation of Final Report	$4,920	3.5	1	0.5	1	1
Total Labor Days	---	**31.5**	5.5	4.0	11.0	11.0
Total Labor Costs	**$43,920**	---	$7,920	$6,080	$14,960	$14,960
Task 2: Electricity Supply Procurement Option Recommendations	**Costs**	**Days**	**Chang**	**White**	**Napoleon**	**Wilson**
Determination of long-term approaches	$7,680	5.5	0.5	1	2	2
Description of recommended features	$10,400	7.5	0.5	1	3	3
Evaluation of benefit and costs of recommendation	$9,920	7.0	1	2	2	2
Determination of critical analysis parameters	$7,040	5.0	1	1	2	1
Electricity procurement program recommendations	$4,200	3.0	0.5	0.5	1	1
Total Labor Days	---	**28.0**	3.5	5.5	10.0	9.0
Total Labor Costs	**$39,240**	---	$5,040	$8,360	$13,600	$12,240
Task 3: Review Legislation and Provide Recommendations	**Costs**	**Days**	**Chang**	**White**	**Napoleon**	**Wilson**
Review of Legislation	$5,180	3.8	0.5	0.25	1	2
Recommendations to modify legislation	$6,180	4.5	0.25	0.25	2	2
Electricity program compliance recommendations	$4,820	3.5	0.25	0.25	2	1
Total Labor Days	---	**11.8**	1.0	0.8	5.0	5.0
Total Labor Costs	**$16,180**	---	$1,440	$1,140	$6,800	$6,800
Task 4:Modeling to Support Recommendations	**Costs**	**Days**	**Chang**	**White**	**Napoleon**	**Wilson**
Modeling to support analysis	$12,120	8.5	1	3	0.5	4
Modeling of historical and prospective costs and benefits	$12,120	8.5	1	3	0.5	4
Total Labor Days	---	**17.0**	2.0	6.0	1.0	8.0
Total Labor Costs	**$24,240**	---	$2,880	$9,120	$1,360	$10,880
Total for all Tasks	**$123,580**					

In keeping with our standard business practices, the Commission will only be invoiced for actual effort expended and actual expenses.

2.10 Summary

Synapse is ready to use its in-depth knowledge of the energy industry and experience working with Delaware and other state agencies to help the Commission accomplish its long term procurement goals on behalf of Delmarva's small-scale customers. We will communicate regularly with Commission staff and will lead discussions of assumptions, methods, and objectives early-on to ensure that the proposed deliverables are completed within the four to six month time frame from the award of the contract in a

manner that meets the Commission's needs and expectations for this project. Our team is ready to begin work immediately, and has sufficient time available throughout the project timeframe to conduct the scope of work discussed in this proposal.

3. Attachments and Forms

- Non-collusion statement
- Exceptions
- Confidentiality and Proprietary Information
- Business References
- Employing Delawareans Report

4. Insurance

Synapse carries Commercial General Liability insurance of $1,000,000 per occurrence as well as Umbrella Liability coverage up to $6,000,000 per occurrence. We will provide the corresponding Certificate of Insurance as proof of insurance prior to signing any contract.

5. Employing Delawareans Report

The Employing Delawareans Report is included as Attachment 9.

Appendix A: RESUMES

On the following pages, we provide resumes for each member of the proposed project team:

- Max Chang, Principal Associate
- Alice Napoleon, Senior Associate
- David White, Senior Consultant
- Rachel Wilson, Senior Associate

Maximilian Chang, Principal Associate

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mchang@synapse-energy.com

PROFESSIONAL EXPERIENCE

Synapse Energy Economics Inc., Cambridge, MA. *Principal Associate*, 2013 – present, *Associate*, 2008 – 2013.

Consults and provides analysis of technologies and policies, electric policy modeling, evaluation of air emissions of electricity generation, and other topics including energy efficiency, consumer advocacy, environmental compliance, and technology strategy within the energy industry. Conducts analysis in utility rate-cases focusing on reliability metrics and infrastructure issues and analyzes the benefits and costs of electric and natural gas energy efficiency measures and programs.

Environmental Health and Engineering, Newton, MA. *Senior Scientist*, 2001 – 2008.

Managed complex EPA-mandated abatement projects involving polychlorinated biphenyls (PCBs) in building-related materials. Provided green building assessment services for new and existing construction projects. Communicated and interpreted environmental data for clients and building occupants. Initiated and implemented web-based health and safety awareness training system used by laboratories and property management companies.

The Penobscot Group, Inc., Boston, MA. *Analyst*, 1994 – 2000.

Authored investment reports on Real Estate Investment Trusts (REITs) for buy-side research boutique. Advised institutional clients on REIT investment strategies and real estate asset exchanges for public equity transactions. Wrote and edited monthly publications of statistical and graphical comparison of coverage universe.

Harvard University Extension School, Cambridge, MA. *Teaching Assistant*, 1995 – 2002.

Teaching Assistant for Environmental Management I and Ocean Environments.

Brigham and Women's Hospital, Boston, MA. *Cancer Laboratory Technician*, 1992 – 1994.

Studied the biological mechanism of tumor eradication in mouse and human models. Organized and performed immunotherapy experiments for experimental cancer therapy. Analyzed and authored results in peer-reviewed scientific journals.

EDUCATION

Harvard University, Cambridge, MA
Master of Science in Environmental Science and Engineering, 2000

Cornell University, Ithaca, NY
Bachelor of Arts in Biology and Classics, 1992

REPORTS

Chang, M. 2014. *Making the Grid More Resilient within Reason: Case Study in Public Service Electric and Gas "Energy Strong" Petition.*

White, D. E., M. Chang, B. Biewald. 2013. *State Energy Efficiency Embedded in Annual Energy Outlook Forecasts: 2013 Update*. Synapse Energy Economics for U.S. Environmental Protection Agency.

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Nogee, A., M. Chang, P. Knight, E.A. Stanton. 2013. *Electricity Market Restructuring and the Nuclear Industry.* Synapse Energy Economics for Whitt Law.

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Koehler, D., M. Chang. 1999 "Search and Disclosure: Corporate Environmental Reports." *Environment* 41 (2): 3.

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Burger, U.L., M. Chang, P. S. Goedegebuure, T. J. Eberlein. 1994. "Changes in host T-cell concentrations but not in donor TIL concentrations at the tumor site following adoptive immunotherapy." *Surgical Forum* 45 (0): 513–515.

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Zuber, M., D. L. Leonard-Vidal, A. L. Rubinstein,A. F. Massaro, M. Chang, D. D. Schoof, T. J. Eberlein. 1990. "In vivo efficacy of murine tumor-infiltrating lymphocytes (TIL) reactivated by anti-CD3." *Journal of Cancer Research and Clinical Oncology* 116; A3.112.28.

Eberlein, T.J., A. F. Massaro, S. Jung, A. L. Rubinstein, U. L. Burger, M. Chang, D. D. Schoof. 1989. "Cyclophosphamide (Cy) immunosuppression potentiates tumor-infiltrating lymphocytes (TIL) therapy in the mouse." Proceedings Annual Meeting: American Association Cancer Research. A30.A1472.

TESTIMONY

State of New Jersey Board of Public Utilities (Docket No. EM14060581): Direct testimony on the reliability commitments filed by Exelon Corporation and Pepco Holdings, Inc. in their joint petition for

the merger of the two entities. On behalf of the New Jersey Division of Rate Counsel. November 14, 2014.

District of Columbia Public Service Commission (Formal Case No. 1119): Direct testimony on the reliability, risk, and environmental impacts of the proposed Exelon-Pepco merger. On behalf of the District of Columbia Government. November 3, 2014.

United States District Court District of Maine (C.A. No. 1:11-cv-00038-GZS): Declaration regarding the ability of the New England electric grid to absorb the impact of a spring seasonal turbine shutdown at four hydroelectric facilities. On behalf of Friends of Merrymeeting Bay and Environment Maine. March 4, 2013.

State of Maine Public Utilities Commission (Docket 2012-00449): Testimony regarding the Request for Approval of Review of Second Triennial Plan Pertaining to Efficiency Maine Trust. On behalf of the Maine Efficiency Trust. January 8, 2013.

New Jersey Board of Public Utilities (Docket No. GO12050363): Testimony regarding the petition of South Jersey Gas Company for approval of the extension of energy efficiency programs and the associated cost recovery mechanism pursuant to N.J.S.A 48:3-98:1. On behalf of the New Jersey Division of Rate Counsel. November 9, 2012.

Resume dated November 2014

Alice Napoleon, Senior Associate

Synapse Energy Economics I 485 Massachusetts Avenue, Suite 2 I Cambridge, MA 02139 I 617-453-7041
anapoleon@synapse-energy.com

PROFESSIONAL EXPERIENCE

Synapse Energy Economics, Inc., Cambridge, MA. *Senior Associate*, June 2013 – present; *Associate*, July 2008 – June 2013; *Research Associate*, April 2005 – July 2008.

- Conduct expert analysis, draft testimony, and provide litigation support regarding energy efficiency program implementation and extension, cost recovery and incentive mechanisms, budgeting, evaluation, cost-effectiveness screening, potential studies, and plans.
- Support the development of a toolkit for energy efficiency program administrators to incorporate Superior Energy Performance™ into new or existing programs to help their industrial customers meet efficiency targets. Develop case studies of existing energy efficiency program offerings that support implementation of strategic energy management by industrial customers.
- Provide ongoing expert consulting for the State of New Jersey regarding its state-administered residential, low-income, commercial, and industrial energy efficiency and combined heat & power programs, including review, analysis, and comments on the following: program performance, designs, and budgets; long-term program funding; cost-benefit analysis; market potential studies; program evaluation; design of the societal benefits charge credit program (a self-directed energy efficiency program); marketing; and overall administrative structure.
- Facilitate residential, commercial, and industrial policy working groups and manage supporting technical analysis of working group recommendations to reduce greenhouse gas emissions in Colorado, South Carolina, and Maryland.
- Research historical emissions of criteria and hazardous air pollutants, greenhouse gases, and coal combustion wastes. Research and develop potential state and local emissions mitigation strategies, such as for reducing ambient fine particulates in New York City.
- Conduct surveys of regional, state, and utility policies and practices regarding ratemaking for energy efficiency, power procurement, risk management, and fuel diversity.
- Research federal, regional, and state case histories on integrated resource planning, power procurement, power plant operations, renewable portfolio standards, and market power.
- Monitor and analyze electricity, coal, and emissions allowance market data, models, and projections, as well as economic and policy developments that impact these markets.
- Write and edit reports, expert testimony, and discovery questions and responses.

Resource Insight, Inc., Arlington, MA. *Research Assistant*, 2003-2005.

Responsible for conducting research and analysis on electric, gas, steam, and water resource issues. Conducted discounted cash flow analysis for asset valuation; developed market-price benchmarks for analysis of power-supply bids using market and regulated prices for energy, capacity, ancillary services, transmission, and ISO services and adjusting for load shape, assignment of transmission rights, and losses. Prepared discovery responses, formal objections, comments, and testimony; collaboratively wrote and edited reports; created and formatted exhibits. Participated in drafting an Energy Plan for New York City. Edited solicitation for competitive power supply to serve aggregated municipal load.

University of Massachusetts, Amherst, MA. *Teaching Assistant*, 2001-2002.

Developed and taught lessons on applied math to a diverse group of incoming graduates; tutored students in microeconomic theory and cost benefit analysis; graded problem sets and memoranda.

International Council for Local Environmental Initiatives, Berkeley, CA. *Cities for Climate Protection Intern for the City of Northampton, MA*, 2001.

Compiled primary and secondary source data on energy consumption and solid waste generation by the municipal government, city residents, and businesses; applied emissions coefficients to calculate total greenhouse gas (GHG) emissions; identified current and planned municipal policies that impact GHG emissions; researched the predicted effects of global warming locally; gathered public feedback to provide acceptable and proactive policy alternatives. Composed a GHG emissions inventory describing research findings; wrote and distributed a policy report and press releases; gave newspaper and radio interviews; addressed public officials and the public during a televised meeting.

University of Massachusetts, Amherst, MA. *Research Assistant*, 2000-2001.

Located federal data sources, identified changes, and updated a research database to evaluate the Habitat Conservation Program; proofread articles and white papers; composed a literature review on land use modelling. Collaboratively administered, tested, and proposed interface enhancements for a web-based data warehouse of regional habitat change research; formally presented the system to an independent research group.

Court Square Data Group, Inc., Springfield, MA.

Administration Manager, 1998-2000.

Analysed profitability and diversity of income sources; managed cash flow, expense, and income data; created budgets; devised and implemented procedures to increase administrative efficiency; implemented new accounting system with minimal disruption to workflow.

Project Administrator, 1996-1998.

Coordinated implementation of software features; identified opportunities for future development; monitored problem resolution; wrote and coordinated production of a user's manual and questionnaires; edited technical proposals and a business plan.

EDUCATION

University of Massachusetts, Amherst, MA
Master of Public Administration, 2002

Rutgers University, New Brunswick, NJ
Bachelor of Arts in Economics, 1995

Syracuse University, Syracuse, NY, 1994

PUBLICATIONS

Takahashi, K. 2014. *Maximizing Public Benefit through Energy Efficiency Investments.* Synapse Energy Economics for Sierra Club.

Keith, G., S. Jackson, A. Napoleon, T. Comings, J. Ramey. 2012. *The Hidden Costs of Electricity: Comparing the Hidden Costs of Power Generation Fuels.* Synapse Energy Economics for Civil Society Institute.

Keith, G., B. Biewald, K. Takahashi, A. Napoleon, N. Hughes, L. Mancinelli, E. Brandt. 2010. *Beyond Business as Usual: Investigating a Future without Coal and Nuclear Power in the US.* Synapse Energy Economics for Civil Society Institute.

Napoleon, A., W. Steinhurst, M. Chang, K. Takahashi, R. Fagan. 2010. *Assessing the Multiple Benefits of Clean Energy: A Resource for States*. US Environmental Protection Agency with research and editorial support from Stratus Consulting, Synapse Energy Economics, Summit Blue, Energy and Environmental Economics, Inc., Demand Research LLC, Abt Associates, Inc., and ICF International.

Napoleon, A., D. Schlissel. 2009. *Economic Impacts of Restricting Mountaintop/Valley Fill Coal Mining in Central Appalachia*. Synapse Energy Economics for Sierra Club, and Appalachian Center for the Economy and the Environment.

Napoleon, A., J. Fisher, W. Steinhurst, M. Wilson, F. Ackerman, M. Resnikoff. 2008. *The Real Costs of Cleaning Up Nuclear Waste: A Full Cost Accounting of Cleanup Options for the West Valley Nuclear Waste Site*. Synapse Energy Economics for Citizens' Environmental Coalition.

Napoleon, A., G. Keith, C. Komanoff , D. Gutman, P. Silva, D. Schlissel, A. Sommer, C. Chen, A. Roschelle, J. Levy, P. Kinney. 2007. *Quantifying and Controlling Fine Particulate Matter in New York City*. Synapse Energy Economics for Coalition Helping Organize a Kleaner Environment, Natural Resources Defense Council (NRDC), Reliant Energy.

Drunsic, M., A. Napoleon, E. Hausman, R. Hornby. 2007. *Arkansas Electric Generation Fuel Diversity: Implementation of EPAct 2005 Amendments to PURPA Section 111 (d)*. Synapse Energy Economics for Arkansas Public Service Commission Staff.

Hausman, E., R. Fagan, D. White, K. Takahashi, A. Napoleon. 2007. *LMP Electricity Markets: Market Operations, Market Power, and Value for Consumers*. Synapse Energy Economics for American Public Power Association.

Synapse Energy Economics. 2006. *Portfolio Management: Tools and Practices for Regulators*. Prepared for National Association of Regulatory Utility Commissioners.

Steinhurst, W., A. Napoleon, K. Takahashi. 2006. *Energy in the Northern Forest Region: A Situation Analysis*. Synapse Energy Economics for Northern Forest Center and The North Country Council.

Synapse Energy Economics. 2006. *Ensuring Delaware's Energy Future: A Response to Executive Order Number 82*. Synapse Energy Economics for Delaware Public Service Commission Staff by the Delaware Cabinet Committee on Energy and others.

Fagan, R., A. Napoleon, A. Rochelle, A. Sommer, W. Steinhurst, D. White. K. Takahashi. 2006. *Mohave Alternatives and Complements Study: Assessment of Carbon Sequestration Feasibility and Markets.* Sargent & Lundy and Synapse Energy Economics, Inc. for Southern California Edison.

TESTIMONY

Nova Scotia Utility and Review Board (Case No. M06247): Direct testimony in the matter of an application by Efficiency Nova Scotia Corporation for approval of its electricity demand-side management plan for 2015. On behalf of Counsel to the Nova Scotia Utility and Review Board. July 14, 2014.

Resume dated September 2014

Dr. David Edwin White, Senior Consultant

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dwhite@synapse-energy.com

SUMMARY OF RELEVANT EXPERIENCE

Dr. White has modeled most of the North American Electric Reliability Council (NERC) regions in the United States and Canada. Many of these projects have involved examining proposed mergers and their potential effects on market power and market prices. A recent focus has been on the analysis of long-term generation expansion plans and the role of uncertainty in those analyses.

Dr. White's recent work includes consulting on electric industry restructuring, stranded costs, system benefits, market power, mergers and acquisitions, generation asset valuation and divestiture, power plant costs and performance, renewable resources, power supply contracts and performance standards, green marketing of electricity, environmental disclosure, climate change policy, environmental externalities valuation, energy conservation and demand-side management, electric power system reliability, and electricity market simulation modeling for price forecasting and market power analysis.

PROFESSIONAL EXPERIENCE

Synapse Energy Economics, Inc., Cambridge, MA. *Senior Consultant*, 1996 — present

Consulting on issues of energy economics, environmental impacts, and utility regulatory policy, including electric industry restructuring, electric power system planning, performance-based regulation, stranded costs, system benefits, market power, mergers and acquisitions, generation asset valuation and divestiture, nuclear and fossil power plant costs and performance, renewable resources, green marketing of electricity, environmental disclosure, climate change policy, environmental externalities valuation, energy conservation and demand-side management, electric power system reliability, avoided costs, fuel prices, dispatch modeling, economic analysis of power plants and resource plans, and risk analysis.

G-W Associates, Arlington, MA. *Principal*, 1985 – 2000

Engineering and environmental analysis. Design and development of computer software for scientific and engineering analysis. Design and implementation of database systems. Consulting on management information systems and operations research applications. Training and documentation for computer applications.

Tellus Institute, Boston, MA. *Associate Scientist*, 1980 – 1986

Participated in a number of electrical demand forecast studies, specializing in the evaluation of the potential for energy conservation and co-generation. Developed methodologies and computer programs for evaluating energy conservation policies. Developed a computer modeling system (LEAP) for

evaluating the resource needs of developing countries. Participated in international energy planning studies and conducted training programs in a number of African and European countries.

Massachusetts Institute of Technology Energy Laboratory, Cambridge, MA. *Research Associate*, 1975 – 1908

Participated in several energy policy studies which evaluated the future demand and supply for electricity in the United States. Designed and developed a mathematical programming model of the US coal and electric utility industries.

EDUCATION

Massachusetts Institute of Technology, Cambridge, MA
Doctor of Philosophy in Civil and Environmental Engineering

Case-Western Reserve University, Cleveland, OH
Master of Science in Physics

The University of Akron, Akron, Ohio
Bachelor of Science in Physics

PUBLICATIONS

Stanton, E. A., J. Daniel, T. Vitolo, P. Knight, D. White, G. Keith. 2014. *Net Metering in Mississippi: Costs, Benefits, and Policy Considerations.* Synapse Energy Economics for the Public Service Commission of Mississippi.

White, D., B. Biewald. 2014. *Findings Regarding the NSPI 2014 Load Forecast.* Synapse Energy Economics for the Nova Scotia Utility and Review Board.

White, D., M. Chang, B. Biewald. 2013. *State Energy Efficiency Embedded in Annual Energy Outlook Forecasts: 2013 Update.* Synapse Energy Economics for the US Environmental Protection Agency.

Stanton, E. A., S. Jackson, G. Keith, E. Malone, D. White, T. Woolf. 2013. *A Clean Energy Standard for Massachusetts.* Synapse Energy Economics for the Massachusetts Clean Energy Center and the Massachusetts Departments of Energy Resources, Environmental Protection, and Public Utilities.

Hornby, R., P. Chernick, D. White, J. Rosenkranz, R. Denhardt, E. A. Stanton, J. Gifford, B. Grace, M. Chang, P. Luckow, T. Vitolo, P. Knight, B Griffiths, B. Biewald. 2013. *Avoided Energy Supply Costs in New England: 2013 Report.* Synapse Energy Economics for the Avoided-Energy-Supply-Component (AESC) Study Group.

Fagan, R., P. Luckow, D. White, R. Wilson. 2013. *The Net Benefits of Increased Wind Power in PJM.* Synapse Energy Economics for Energy Future Coalition.

Neubauer, M., B. Foster, R. N. Elliot, D. White, R. Hornby. 2013. *Ohio's Energy Efficiency Resource Standard: Impacts on the Ohio Wholesale Electricity Market and Benefits to the State.* Synapse Energy Economics for American Council for an Energy-Efficient Economy (ACEEE).

Takahashi, K. et al. 2013. *Economic and Environmental Analysis of Residential Heating and Cooling Systems: A Study of Heat Pump Performance in U.S. Cities*. Proceeding of the 7th International Conference on Energy Efficiency in Domestic Appliances and Lighting (EEDAL'13), September 12, 2013.

Whited, M., D. White, S. Jackson, P. Knight, E.A. Stanton. 2013. *Declining Markets for Montana Coal*. Synapse Energy Economics for Northern Plains Resource Council.

Chang, M., D. White, E. Hausman. 2012. *Risks to Ratepayers: An Examination of the Proposed William States Lee III Nuclear Generation Station, and the Implications of "Early Cost Recovery" Legislation*. Synapse Energy Economics for Consumers Against Rate Hikes.

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Hornby, R., R. Fagan, D. White, J. Rosenkranz, P. Knight, R. Wilson. 2012. *Potential Impacts of Replacing Retiring Coal Capacity in the Midwest Independent System Operator (MISO) Region with Natural Gas or Wind Capacity.* Synapse Energy Economics for National Association of Regulatory Utility Commissioners.

Chang, M., D. White, P. Knight, B. Biewald. 2012. *Energy Benefits Resulting from the Investment of 2010 RGGI Auction Revenues in Energy Efficiency.* Synapse Energy Economics for Regulatory Assistance Project.

Hornby, R., D. White, T. Vitolo, T. Comings, K. Takahashi. 2012. *Potential Impacts of a Renewable and Energy Efficiency Portfolio Standard in Kentucky.* Synapse Energy Economics for Mountain Association for Community Economic Development and Kentucky Sustainable Energy Alliance.

Fisher, J., C. James, N. Hughes, D. White, R. Wilson, and B. Biewald. 2011. *Emissions Reductions from Renewable Energy and Energy Efficiency in California Air Quality Management Districts.* Synapse Energy Economics for California Energy Commission.

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Chang, M., D. White, E. Hausman, N. Hughes, B. Biewald. 2011. *Big Risks, Better Alternatives: An Examination of Two Nuclear Energy Projects in the US.* Synapse Energy Economics for Union of Concerned Scientists.

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White, D., R. Fagan, A. Napoleon. 2011. *New Jersey 2011 Fixed Price Basic Generation Service Auction.* Synapse Energy Economics for New Jersey Division of the Ratepayer Advocate.

Johnston, L., E. Hausman, B. Biewald, R. Wilson, D. White. 2011. *2011 Carbon Dioxide Price Forecast*. Synapse Energy Economics.

Chang, M., D. White, L. Johnston, B. Biewald. 2010. *Electricity Energy Efficiency Benefits of RGGI Proceeds: An Initial Analysis*. Synapse Energy Economics for Regulatory Assistance Project.

Hornby, R., D. White, B. Biewald, C. James, B. Warfield, M. Chang, P. Chernick, C. Swanson, I. Goodman, B. Grace, J. Gifford. 2009. *Avoided Energy Supply Costs in New England: 2009 Report*. Synapse Energy Economics for Avoided-Energy-Supply-Component (AESC) Study Group.

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Schlissel, D., R. Wilson, L. Johnston, D.White. 2009. *An Assessment of Santee Cooper's 2008 Resource Planning.* Synapse Energy Economics for Rockefeller Family Fund.

Hornby, R., D. White, P. Peterson. 2008. *Wholesale Natural Gas Prices in New England*. Synapse Energy Economics for the Office of the Attorney General of Massachusetts.

White, D., R. Hornby. 2008. *Energizing Virginia: Efficiency First.* Synapse Energy Economics for The American Council for an Energy-Efficient Economy (ACEEE).

Schlissel, D., L. Johnston, B. Biewald, D. White, E.Hausman, C. James, J.Fisher. 2008. *Synapse 2008 CO^2 Price Forecasts.* Synapse Energy Economics.

Hornby, R., C. Salamone, S. Perry, D. White, K. Takahashi. 2008. *Advanced Metering Infrastructure-Implications for Residential Customers in New Jersey*. Synapse Energy Economics for New Jersey Division of the Ratepayer Advocate.

Hornby, R., J. Loiter, P. Mosenthal, T. Franks, R. Fagan and D. White. 2008. *Review of AmerenUE February 2008 Integrated Resource Plan.* Synapse Energy Economics for Missouri Department of Natural Resources.

Hurley, D., D. White, R. Hornby. 2008. *Forecast of New England Forward Capacity Market (FCM) Clearing Prices 2008 – 2017.* Synapse Energy Economics.

Drunsic, M., D. White, R. Hornby. 2008. *Impacts of Distributed Generation on Wholesale Electric Prices and Air Emissions in Massachusetts.* Synapse Energy Economics for Massachusetts Technology Collaborative.

White, D., R. Hornby, J. Wallach, P. Chernick. 2008. *Risk Analysis of Procurement Strategies for Residential Standard Offer Service.* Synapse Energy Economics and Resource Insight for Maryland Office of the People's Counsel.

Hornby, R., C. James, K. Takahashi, D. White. 2008. *Increasing Demand Response in Maine.* Synapse Energy Economics for the Maine Public Utilities Commission.

Hornby, R., C. Swanson, M. Drunsic, D. White, P. Chernick, B. Biewald, J. Kallay. 2007. *Avoided Energy Supply Costs in New England: 2007 Final Report.* Synapse Energy Economics for Avoided-Energy-Supply-Component (AESC) Study Group.

Peterson, P., D. Hurley, D. White. 2007. *ISO New England Scenario Analysis Companion Report Constructing a Future that Meets Regional Goals* .Synapse Energy Economics for Conservation Law Foundation and the Northeast Energy Efficiency Partnerships.

Johnston, L., E. Hausman, A. Sommer, B. Biewald, T. Woolf, D. Schlissel, A. Roschelle, D. White. 2007. *Climate Change and Power: Carbon Dioxide Emissions Costs and Electricity Resource Planning.* Synapse Energy Economics.

Hausman, E., R. Fagan, D. White, K. Takahashi, A. Napoleon. 2007. *LMP Electricity Markets: Market Operations, Market Power, and Value for Consumer.* Synapse Energy Economics for the American Public Power Association.

Steinhurst, W., B. Biewald, D. White, K. Takahashi, A. Napoleon, A. Roschelle, A. Sommer, E. Hausman. 2006. *Ensuring Delaware's Energy Future: A Response to Executive Order No. 82.* Synapse Energy Economics and Delaware Cabinet Committee on Energy for the Delaware Public Service Commission Staff.

Fagan, R., A. Napoleon, A. Rochelle, A. Sommer, W. Steinhurst, D. White, K. Takahashi. 2006. *Mohave Alternatives and Complements Study: Assessment of Carbon Sequestration Feasibility and Markets.* Synapse Energy Economics for Southern California Edison.

Woolf, T., D. White, C. Chen, A. Sommer. 2005. *Potential Cost Impacts of a Renewable Portfolio Standard in New Brunswick*. Synapse Energy Economics for New Brunswick Department of Energy.

Hausman, E., P. Peterson, D. White, B. Biewald. 2005. *An RPM Case Study: Higher Costs for Consumers, Windfall Profits for Exelon*. Synapse Energy Economics for Illinois Citizens Utility Board.

White, D., B. Biewald. 2005. *Electric Price Forecasts for St. Lawrence Hydroelectric Generation*. Synapse Energy Economics for International Joint Commission (IJC).

Peterson, P., D. White, A. Roschelle, B. Biewald. 2004. *Capacity for the Future: Kinky Curves and Other Reliability Options*. Synapse Energy Economics.

Biewald, B., D. White, G. Keith, T. Woolf. 2004. *A Responsible Energy Future: an efficient, cleaner and balanced scenario for the US electrical system.* Synapse Energy Economics for National Commission on Energy Policy and National Association of State PIRGs.

Biewald, B., W. Steinhurst, D. White, A. Roschelle. 2004. *Electricity Prices in PJM: A Comparison of Wholesale Power Costs in the PJM Market to Indexed Generation Service Costs*. Synapse Energy Economics for PJM Interconnection, LLC.

White, D. 2004. *A Balanced Energy Plan for the Interior West*. Synapse Energy Economics, Western Resource Advocates, and Tellus Institute for Hewlett Foundation Energy Series.

Biewald, B., C. Chen, A. Sommer, W. Steinhurst, D. White. 2003. *Comments on the RPS Cost Analyses of the Joint Utilities and the DPS Staff.* Synapse Energy Economics for the Renewable Energy Technology and Environment Coalition.

Keith, G., B. Biewald, D. White, M. Drunsic. 2003. *Modeling Demand Response and Air Emissions in New England*. Synapse Energy Economics for US Environmental Protection Agency.

Keith, G., B. Biewald, D. White, A. Sommer, C. Chen. 2003. *Cleaner Air, Fuel Diversity and High-Quality Jobs: Reviewing Selected Potential Benefits of an RPS in New York State*. Synapse Energy Economics for the Renewable Energy Technology and Environment Coalition.

Synapse Energy Economics. 2003. *The New England Experiment: An Evaluation of the Wholesale Electricity Markets*. Prepared for Connecticut Office of Consumer Counsel, Maine Office of the Public Advocate, and New Hampshire Office of Consumer Advocate.

Woolf, T., G. Keith, D. White, M. Drunsic, M. Ramiro, J. Ramsey, J. Levy, P. Kinney, S. Greco, K. Knowlton, C. Komanoff, D. Gutman. 2003. *Air Quality in Queens: Cleaning Up the Air in Queens County and Neighboring Regions*. Synapse Energy Economics, Konheim & Ketcham and Komanoff Energy Associates for Natural Resources Defense Council (NRDC), Keyspan Energy, and the Coalition Helping to Organize a Kleaner Environment.

Chen, C., D. White, T. Woolf, L. Johnston. 2003. *The Maryland Renewable Portfolio Standard: An Assessment of Potential Cost Impacts*. Synapse Energy Economics for the Maryland Public Interest Research Group.

Woolf, T., D. White. 2002. *Powering the South: A Clean and Affordable Energy Plan for the Southern United States*. Synapse Energy Economics for Renewable Energy Policy Project and a coalition of Southern environmental advocates.

Chernick, P., S. Geller, B. Biewald, and D. White. 2001. *Updated Avoided Energy-Supply Costs for Demand-Side Management Screening in Massachusetts*. Resource Insight, Synapse Energy Economics for Avoided-Energy-Supply-Component (AESC) Study Group.

Biewald, B., D. White, M. Ramiro. 2001. *Electricity Market Analysis of Coal Waste Regulations: An Illustrative Midwest Case Study*. Synapse Energy Economics for US Environmental Protection Agency.

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Biewald, B., D. White, T. Woolf, F. Ackerman, W. Moomaw. 1998. *Grandfathering and Environmental Comparability: An Economic Analysis of Air Emission Regulations and Electricity Market Distortions*. Synapse Energy Economics for National Association of Regulatory Utility Commissioners.

Biewald, B., D. White. 1998. *Analysis of Market Power in the APS and Duquesne Service Territories*. Synapse Energy Economics for Maryland Office of People's Counsel.

Moskovitz, D., T. Austin, C. Harrington, B. Biewald, D. White, R. Bigelow. 1997. *Full Environmental Disclosure for Electricity: Tracking and Reporting Key Information*. Synapse Energy Economics for Regulatory Assistance Project, funded by Pew Charitable Trusts, Joyce-Mertz Gilmore Foundation, US Environmental Protection Agency, and US Department of Energy.

Rowe, R.D., C.M. Lang, L.G. Chestnut, D.A. Latimer, D.A. Rae, S.M. Bernow, D. White. 1995. *New York State Environmental Externalities Cost Study*, ed. Empire State Electric Energy Research Corporation (ESEERCO). New York: Oceana Publications.

PRESENTATIONS

White, D., Environmental Futures, and Tellus Institute. 1998. "New England Tracking System, a methodology for a region-wide electricity tracking system to support the implementation of restructuring-related policies" Presentation for the New England Governors' Conference, October 1998.

Synapse Energy Economics. 1998. "Implications of Premature Nuclear Plant Closures: Funding Shortfalls for Nuclear Plant Decommissioning and Spent Fuel Transportation and Storage." Presentation at the United States Association for Energy Economics and International Association for Energy Economics 19th Annual North American Conference in Albuquerque, NM, October 1998.

Biewald, B., D. White, W. Steinhurst. 1997. "Horizontal Market Power in New England Electricity Markets: Simulation Results and a Review of NEPOOL's Analysis." Synapse Energy Economics presentation for the New England Conference of Public Utility Commissioners, June1997.

Bernow, S., B. Biewald, W. Dougherty, D. White. 1995. "Counting the Costs: Scientific Uncertainty and Valuation Perspective in EXMOD." Presentation at the technical meeting of International Atomic Energy Agency in Vienna, Austria, December 1995.

TESTIMONY

New Jersey Board of Public Utilities (Docket No. EM01050308): Analysis of the proposed merger between Conectiv and PEPCo. On behalf of New Jersey Division of Ratepayer Advocate. September 2001.

New Jersey Board of Public Utilities (Docket No. EM00110870): Analysis of the proposed merger between FirstEnergy and GPU. On behalf of New Jersey Division of Ratepayer Advocate. April 2001.

Vermont Public Service Board (Dockets Nos. 6120 and 6460): Analysis of used and useful policy issues, electricity market prices, and above market costs of the purchase from Hydro Quebec. On behalf of Vermont Public Service Department. March 2001.

Department of Energy (Docket No. EE-RM-500): Submitted expert comments *Marginal Price Assumptions for Estimating Customer Benefits of Air Conditioner Efficiency Standards* regarding the Department of Energy's proposed rules for efficiency standards for central air conditioners and heat pumps. On behalf of the Appliance Standards Awareness Project. December 2000.

Massachusetts Department of Environmental Protection: Submitted comments on reliability implications of proposed emission standards for power plants. July 2000.

Arkansas Public Service Commission (Docket No. 00-048-R): Submitted comments regarding requirements for electricity market power analyses. On behalf of Arkansas Public Service Commission Staff. June 2000.

West Virginia Public Service Commission (Case No. 98-0452-E-GI): Analysis regarding AEP and Allegheny Power restructuring, market power, divestiture of generation, electric system market price modeling, statistical analysis of comparable sales, and responsibility for stranded costs and gains. On behalf of West Virginia Consumer Advocate. August 1999.

*C***onnecticut Department of Public Utility Control (Docket No. 99-03-36):** Testimony regarding Connecticut Light and Power Company standard offer service, market prices for electricity and the influence of market power, simulation analysis of the New England electricity market. July 1999.

Connecticut Department of Public Utility Control (Docket No. 99-02-05: Testimony regarding market power, market prices, and simulation modeling as related to the application of Connecticut Light & Power Company for recovery of stranded costs. April 1999.

Maryland Public Service Commission (Case No. 8797): Testimony on the topic of simulation analysis of the ECAR market and projected market prices for electricity for estimation of Potomac Electric Company's stranded generation costs and unbundled rates. January 1999.

Maryland Public Service Commission (Case No. 8795): Testimony on the topic of simulation analysis of the PJM market and projected market prices for electricity for estimation of Delmarva Power and Light Company's stranded generation costs and unbundled rates. December 1998.

Vermont Public Service Board (Docket No. 6107): Testimony regarding excess capacity, used & useful, and the economics of Green Mountain Power's purchase from Hydro Quebec. September 1998.

Resume dated September 2014

Rachel Wilson, Senior Associate

Synapse Energy Economics I 485 Massachusetts Avenue, Suite 2 I Cambridge, MA 02139 I 617-453-7044
rwilson@synapse-energy.com

PROFESSIONAL EXPERIENCE

Synapse Energy Economics Inc., Cambridge, MA. *Senior Associate*, 2013 – present, *Associate*, 2010 – June 2013, *Research Associate*, 2008 – 2010.

- Conducts research and writes testimony and reports on a wide range of issues relating to electric utilities, including: integrated resource planning; federal and state clean air policies; emissions from electricity generation; electric system dispatch; and environmental compliance technologies, strategies, and costs.
- Uses optimization and electricity dispatch models, including Strategist, PROMOD, PROSYM/Market Analytics, and PLEXOS to conduct analyses of utility service territories and regional energy markets.

Analysis Group, Inc., Boston, MA.

Associate, Energy Practice, 2007 – 2008.

- Supported an expert witness asked to opine on various topics in the electric industry as they applied to merchant generators and provided incentives for their behavior in the late 1990s and early 2000s.
- Analyzed data related to coal production on Indian land and contractual royalties paid to the tribe over a 25 year period to determine if discrepancies exist between these values for the purposes of potential litigation.
- Examined Canadian policies relating to carbon dioxide, and assisted with research on linkage of international tradable permit systems.
- Managed analysts' work processes and evaluated work products.

Senior Analyst Intern, Energy Practice, 2006 – 2007.

- Supported an expert witness in litigation involving whether a defendant power company could financially absorb a greater investment in pollution control under its debt structure while still offering competitive rates. Analyzed impacts of federal and state clean air laws on energy generators and providers. Built a quantitative model showing the costs of these clean air policies to the defendant over a 30 year period. Built a financial model calculating impacts of various pollution control investment requirements.
- Researched the economics of art; assisted in damage calculations in arbitration between an artist and his publisher.

Yale Center for Environmental Law and Policy, New Haven, CT. *Research Assistant*, 2005 – 2007.

- Gathered and managed data for the Environmental Performance Index, presented at the 2006 World Economic Forum. Interpreted statistical output, wrote critical analyses of results, and edited report drafts.
- Part of the team that produced *Green to Gold*, an award-winning book on corporate environmental management and strategy. Managed data, conducted research, and implemented marketing strategy.

Marsh Risk and Insurance Services, Inc., Los Angeles, CA. *Risk Analyst*, Casualty Department, 2003 – 2005.

- Evaluated Fortune 500 clients' risk management programs/requirements and formulated strategic plans and recommendations for customized risk solutions.
- Supported the placement of $2 million in insurance premiums in the first year and $3 million in the second year.
- Utilized quantitative models to create loss forecasts, cash flow analyses and benchmarking reports.
- Completed a year-long Graduate Training Program in risk management; ranked #1 in the western region of the US and shared #1 national ranking in a class of 200 young professionals.

EDUCATION

Yale School of Forestry & Environmental Studies, New Haven, CT
Masters of Environmental Management, concentration in Law, Economics, and Policy with a focus on energy issues and markets, 2007

Claremont McKenna College, Claremont, California
Bachelor of Arts in Environment, Economics, Politics (EEP), 2003. *Cum laude* and EEP departmental honors.

School for International Training, Quito, Ecuador
Semester abroad studying Comparative Ecology. Microfinance Intern – Viviendas del Hogar de Cristo in Guayaquil, Ecuador, Spring 2002.

ADDITIONAL SKILLS AND ACCOMPLISHMENTS

- Microsoft Office Suite, Lexis-Nexis, Platts Energy Database, Strategist, PROMOD, PROSYM/Market Analytics, and PLEXOS, some SAS and STATA.
- Competent in oral and written Spanish.

- Hold the Associate in Risk Management (ARM) professional designation.

PUBLICATIONS

Stanton, E. A., P. Knight, J. Daniel, B. Fagan, D. Hurley, J. Kallay, E. Karaca, G. Keith, E. Malone, W. Ong, P. Peterson, L. Silvestrini, K. Takahashi, R. Wilson. 2015. *Massachusetts Low Gas Demand Analysis: Final Report.* Synapse Energy Economics for the Massachusetts Department of Energy Resources.

Wilson, R., B. Biewald. 2013. *Best Practices in Electric Utility Integrated Resource Planning: Examples of State Regulations and Recent Utility Plans.* Synapse Energy Economics for Regulatory Assistance Project.

Fagan, R., P. Luckow, D. White, R. Wilson. 2013. *The Net Benefits of Increased Wind Power in PJM.* Synapse Energy Economics for Energy Future Coalition.

Hornby, R., R. Wilson. 2013. *Evaluation of Merger Application filed by APCo and WPCo.* Synapse Energy Economics for West Virginia Consumer Advocate Division.

Johnston, L., R. Wilson. 2012. *Strategies for Decarbonizing Electric Power Supply.* Synapse Energy Economics for Regulatory Assistance Project, Global Power Best Practice Series, Paper #6.

Wilson, R., P. Luckow, B. Biewald, F. Ackerman, E. Hausman. 2012. *2012 Carbon Dioxide Price Forecast.* Synapse Energy Economics.

Hornby, R., R. Fagan, D. White, J. Rosenkranz, P. Knight, R. Wilson. 2012. *Potential Impacts of Replacing Retiring Coal Capacity in the Midwest Independent System Operator (MISO) Region with Natural Gas or Wind Capacity.* Synapse Energy Economics for Iowa Utilities Board.

Fagan, R., M. Chang, P. Knight, M. Schultz, T. Comings, E. Hausman, R. Wilson. 2012. *The Potential Rate Effects of Wind Energy and Transmission in the Midwest ISO Region*. Synapse Energy Economics for Energy Future Coalition.

Fisher, J., C. James, N. Hughes, D. White, R. Wilson, and B. Biewald. 2011. *Emissions Reductions from Renewable Energy and Energy Efficiency in California Air Quality Management Districts.* Synapse Energy Economics for California Energy Commission.

Wilson, R. 2011. *Comments Regarding MidAmerican Energy Company Filing on Coal-Fired Generation in Iowa*. Synapse Energy Economics for the Iowa Office of the Consumer Advocate.

Hausman, E., T. Comings, R. Wilson, and D. White. 2011. *Electricity Scenario Analysis for the Vermont Comprehensive Energy Plan 2011*. Synapse Energy Economics for Vermont Department of Public Service.

Hornby, R., P. Chernick, C. Swanson, D. White, J. Gifford, M. Chang, N. Hughes, M. Wittenstein, R. Wilson, B. Biewald. 2011. *Avoided Energy Supply Costs in New England: 2011 Report*. Synapse Energy Economics for Avoided-Energy-Supply-Component (AESC) Study Group.

Wilson, R., P. Peterson. 2011. *A Brief Survey of State Integrated Resource Planning Rules and Requirements*. Synapse Energy Economics for American Clean Skies Foundation.

Johnston, L., E. Hausman., B. Biewald, R. Wilson, D. White. 2011. *2011 Carbon Dioxide Price Forecast*. Synapse Energy Economics.

Fisher, J., R. Wilson, N. Hughes, M. Wittenstein, B. Biewald. 2011. *Benefits of Beyond BAU: Human, Social, and Environmental Damages Avoided Through the Retirement of the US Coal Fleet*. Synapse Energy Economics for Civil Society Institute.

Peterson, P., V. Sabodash, R. Wilson, D. Hurley. 2010. *Public Policy Impacts on Transmission Planning*. Synapse Energy Economics for Earthjustice.

Fisher, J., J. Levy, Y. Nishioka, P. Kirshen, R. Wilson, M. Chang, J. Kallay, C. James. 2010*. Co-Benefits of Energy Efficiency and Renewable Energy in Utah: Air Quality, Health and Water Benefits.* Synapse Energy Economics, Harvard School of Public Health, Tufts University for State of Utah Energy Office.

Wilson, R. 2009. "The Energy-Water Nexus: Interactions, Challenges, and Policy Solutions." Presentation at the National Drinking Water Symposium 2009, October 2009.

Fisher, J., C. James, L. Johnston, D. Schlissel, R. Wilson. 2009. *Energy Future: A Green Alternative for Michigan*. Synapse Energy Economics for Natural Resources Defense Council (NRDC) and Energy Foundation.

Schlissel, D., R. Wilson, L. Johnston, D. White. 2009. *An Assessment of Santee Cooper's 2008 Resource Planning*. Synapse Energy Economics for Rockefeller Family Fund.

Schlissel, D., A. Smith, R. Wilson. 2008. *Coal-Fired Power Plant Construction Costs*. Synapse Energy Economics.

TESTIMONY

Oklahoma Corporation Commission (Cause No. PUD 201400229): Direct testimony evaluating the modeling of Oklahoma Gas & Electric supporting its request for approval and cost recovery of a Clean Air Act compliance plan and Mustang modernization, and presenting results of independent Gentrader modeling analysis. On behalf of Sierra Club. December 16, 2014.

Michigan Public Service Commission (Case No. U-17087): Direct testimony before the Commission discussing Strategist modeling relating to the application of Consumers Energy Company for the authority to increase its rates for the generation and distribution of electricity. On behalf of the Michigan Environmental Council and Natural Resources Defense Council. February 21, 2013.

Indiana Utility Regulatory Commission (Cause No. 44217): Direct testimony before the Commission discussing PROSYM/Market Analytics modeling relating to the application of Duke Energy Indiana for Certificates of Public Convenience and Necessity. On behalf of Citizens Action Coalition, Sierra Club, Save the Valley, and Valley Watch. November 29, 2012.

Kentucky Public Service Commission (Case No. 2012-00063): Direct testimony before the Commission discussing upcoming environmental regulations and electric system modeling relating to the application

of Big Rivers Electric Corporation for a Certificate of Public Convenience and Necessity and for approval of its 2012 environmental compliance plan. On behalf of Sierra Club. July 23, 2012.

Kentucky Public Service Commission (Case No. 2011-00401): Direct testimony before the Commission discussing STRATEGIST modeling relating to the application of Kentucky Power Company for a Certificate of Public Convenience and Necessity, and for approval of its 2011 environmental compliance plan and amended environmental cost recovery surcharge. On behalf of Sierra Club. March 12, 2012.

Kentucky Public Service Commission (Case No. 2011-00161 and Case No. 2011-00162): Direct testimony before the Commission discussing STRATEGIST modeling relating to the applications of Kentucky Utilities Company, and Louisville Gas and Electric Company for Certificates of Public Convenience and Necessity, and approval of its 2011 compliance plan for recovery by environmental surcharge. On behalf of Sierra Club and Natural Resources Defense Council (NRDC). September 16, 2011.

Minnesota Public Utilities Commission (OAH Docket No. 8-2500-22094-2 and MPUC Docket No. E-017/M-10-1082): Rebuttal testimony before the Commission describing STRATEGIST modeling performed in the docket considering Otter Tail Power's application for an Advanced Determination of Prudence for BART retrofits at its Big Stone plant**.** On behalf of Izaak Walton League of America, Fresh Energy, Sierra Club, and Minnesota Center for Environmental Advocacy. September 7, 2011.

Resume dated January 2015

APPENDIX B: ATTACHMENTS

On the following pages, we provide the following attachments:

- Attachment 1: N/A
- Attachment 2: Non-collusion statement
- Attachment 3: Exceptions
- Attachment 4: Confidentiality and Proprietary Information
- Attachment 5: Business References
- Attachment 6: N/A
- Attachment 7: N/A
- Attachment 8: N/A
- Attachment 9: Employing Delawareans Report
- Attachment 10: N/A

STATE OF DELAWARE
Public Service Commission Staff

Attachment 2

CONTRACT NO.: STA15129PSCDPLSOSR
CONTRACT TITLE: Consulting Services to Review Utility Standard Offer Service Electricity Procurement
OPENING DATE: January 16, 2015 at 4:30 PM (Local Time)

NON-COLLUSION STATEMENT

This is to certify that the undersigned Vendor has neither directly nor indirectly, entered into any agreement, participated in any collusion or otherwise taken any action in restraint of free competitive bidding in connection with this proposal, **and further certifies that it is not a sub-contractor to another Vendor who also submitted a proposal as a primary Vendor in response to this solicitation** submitted this date to the State of Delaware, Public Service Commission

It is agreed by the undersigned Vendor that the signed delivery of this bid represents the Vendor's acceptance of the terms and conditions of this solicitation including all specifications and special provisions.

NOTE: Signature of the authorized representative **MUST** be of an individual who legally may enter his/her organization into a formal contract with the State of Delaware, Public Service Commission.

COMPANY NAME SYNAPSE ENERGY ECONOMICS (Check one)

X	Corporation
	Partnership
	Individual

NAME OF AUTHORIZED REPRESENTATIVE (Please type or print) MJ JENSEN

SIGNATURE [signature] TITLE DIRECTOR OF FINANCE + ADMIN

COMPANY ADDRESS 485 MASSACHUSETTS AVENUE, SUITE 2, CAMBRIDGE, MA 02139

PHONE NUMBER (617) 661-3248 FAX NUMBER (617) 661-0599

EMAIL ADDRESS MJJENSEN@SYNAPSE-ENERGY.COM

FEDERAL E.I. NUMBER 04-331-6408 STATE OF DELAWARE LICENSE NUMBER _____

COMPANY CLASSIFICATIONS: CERT. NO.:	Certification type(s)	Circle all that apply
	Minority Business Enterprise (MBE)	Yes (No)
	Woman Business Enterprise (WBE)	Yes (No)
	Disadvantaged Business Enterprise (DBE)	Yes (No)
	Veteran Owned Business Enterprise (VOBE)	Yes (No)
	Service Disabled Veteran Owned Business Enterprise (SDVOBE)	Yes (No)

[The above table is for informational and statistical use only.]

PURCHASE ORDERS SHOULD BE SENT TO: (COMPANY NAME) SAME AS ABOVE

ADDRESS _____

CONTACT _____

PHONE NUMBER _____ FAX NUMBER _____

EMAIL ADDRESS _____

AFFIRMATION: Within the past five years, has your firm, any affiliate, any predecessor company or entity, owner, Director, officer, partner or proprietor been the subject of a Federal, State, Local government suspension or debarment?

YES _____ NO X if yes, please explain _____

THIS PAGE SHALL HAVE ORIGINAL SIGNATURE, BE NOTARIZED AND BE RETURNED WITH YOUR PROPOSAL

SWORN TO AND SUBSCRIBED BEFORE ME this 13 day of January, 2015

Notary Public [signature] My commission expires 7/27/18

City of Cambridge County of Middlesex State of MA

JANICE CONYERS
Notary Public
Commonwealth of Massachusetts
My Commission Expires
July 27, 2018

STATE OF DELAWARE
Public Service Commission Staff

Attachment 3

Contract No. STA15129PSCDPLSOSR
Contract Title: Consulting Services to Review Utility Standard Offer Service Electricity Procurement

EXCEPTION FORM

Proposals must include all exceptions to the specifications, terms or conditions contained in this RFP. If the vendor is submitting the proposal without exceptions, please state so below.

☒ By checking this box, the Vendor acknowledges that they take no exceptions to the specifications, terms or conditions found in this RFP.

Paragraph # and page #	Exceptions to Specifications, terms or conditions	Proposed Alternative

Note: use additional pages as necessary.

STATE OF DELAWARE
Public Service Commission Staff

Attachment 4

Contract No. STA15129PSCDPLSOSR
Contract Title: Consulting Services to Review Utility Standard Offer Service Electricity Procurement
CONFIDENTIAL INFORMATION FORM

☒ By checking this box, the Vendor acknowledges that they are not providing any information they declare to be confidential or proprietary for the purpose of production under 29 Del. C. ch. 100, Delaware Freedom of Information Act.

Confidentiality and Proprietary Information

Note: use additional pages as necessary.

STATE OF DELAWARE
Public Service Commission Staff

Attachment 5

Contract No: **STA15129PSCDPLSOSR**
Contract Title: Consulting Services to Review Utility Standard Offer Service Electricity Procurement

BUSINESS REFERENCES

List a minimum of three business references, including the following information:

- Business Name and Mailing address
- Contact Name and phone number
- Number of years doing business with
- Type of work performed

Please do not list any State Employee as a business reference. If you have held a State contract within the last 5 years, please provide a separate list of the contract(s).

1.	**Contact Name & Title:**	Jeremy Newberger
	Business Name:	AESC Study Group, National Grid rep
	Address:	40 Sylvan Rd. Waltham, MA 02451
	Email:	Jeremy.newberger@us.ngrid.com
	Phone # / Fax #:	781-907-1548
	Current Vendor (YES or NO):	NO
	Years Associated & Type of Work Performed:	Synapse conducted studies on Avoided Energy Supply Costs in New England resulting from improvements in energy efficiency. 2007-2013.

2.	**Contact Name & Title:**	Ami Morita, Managing Attorney
	Business Name:	New Jersey Division of Rate Counsel
	Address:	140 East Front Street, P.O. Box 003, Trenton, NJ 08625
	Email:	amorita@rpa.state.nj.us
	Phone # / Fax #:	609-984-1460
	Current Vendor (YES or NO):	YES
	Years Associated & Type of Work Performed:	Synapse assists Rate Counsel on multiple issues including: the Basic Generation Service procurement working group since 2007, rate cases proceedings since 2008, and merger proceedings in 2005 and currently.

3.	**Contact Name & Title:**	Dave Peck, Program Supervisor
	Business Name:	California Public Utilities Commission Office of Ratepayer Advocates
	Address:	505 Van Ness Avenue, San Francisco, CA 94102
	Email:	david.peck@cpuc.ca.gov
	Phone # / Fax #:	415-703-1213
	Current Vendor (YES or NO):	YES
	Years Associated & Type of Work Performed:	Synapse assists the California ORA with long term procurement planning and other issues. 2006 to the present.

STATE OF DELAWARE
Public Service Commission Staff

Attachment 9

Contract No. STA15129PSCDPLSOSR
Contract Title: Consulting Services to Review Utility Standard Offer Service Electricity Procurement

EMPLOYING DELAWAREANS REPORT

As required by House Bill # 410 (Bond Bill) of the 146th General Assembly and under Section 30, No bid for any public works or professional services contract shall be responsive unless the prospective bidder discloses its reasonable, good-faith determination of:

1. Number of employees reasonable anticipated to be employed on the project: 4
2. Number and percentage of such employees who are bona fide legal residents of Delaware: 0

   Percentage of such employees who are bona fide legal residents of Delaware: 0
3. Total number of employees of the bidder: 33
4. Total percentage of employees who are bona fide resident of Delaware: 0

If subcontractors are to be used:

1. Number of employees who are residents of Delaware: _____
2. Percentage of employees who are residents of Delaware: _____

"Bona fide legal resident of this State" shall mean any resident who has established residence of at least 90 days in the State.