

November 21, 2025

Kimberly N. O'Brian  
Kathryn H. Bowman  
Louisiana Public Service Commission  
602 North Fifth Street (Galvez Building) (70802)  
P.O. Box 91154  
Baton Rouge, Louisiana 70821-9154



LONDON  
ECONOMICS  
717 Atlantic Ave., Suite 1A  
Boston, MA 02111 USA  
Tel: (617) 933-7200  
Fax: (617) 933-7201

Re: RFP 25-13 Cleco, Entergy, and SWEPCO IRPs (Consultant).

*DOCKET NO. TBD, Cleco Power, LLC, ex parte. In re: Request to initiate 2025 Integrated Resource Planning ("IRP") Process pursuant to General Order (Corrected) dated August 28, 2024 (R-36262).*

*DOCKET NO. TBD, Entergy Louisiana, LLC, ex parte. In re: Request to Initiate 2025 Integrated Resource Planning ("IRP") Process pursuant to the General Order (Corrected) dated August 28, 2024 (R-36262).*

*DOCKET NO. TBD, Southwestern Electric Power Company, ex parte. In re: Request to initiate 2025 Integrated Resource Planning ("IRP") Process pursuant to General Order (Corrected) dated August 28, 2024 (R-36262).*

Dear Ms. O'Brian:

Please find attached London Economics International LLC ("LEI")'s proposal to act as an outside independent technical consultant and assist the Louisiana Public Service Commission ("LPSC") with the IRP processes of Cleco Power LLC, Entergy Louisiana, LLC, and Southwestern Electric Power Company. LEI offers a total indicative budget of \$199,926 for the three IRP Dockets (\$66,642 for each IRP Docket), which includes professional fees and estimated travel and other direct costs, detailed further in Section 4.

LEI is uniquely qualified for this role with extensive knowledge of ratemaking and familiarity with the Midcontinent Independent System Operator ("MISO") region, having performed a broad range of technical consulting services related to regulatory oversight to LPSC and other regulatory bodies in the region.

There are no actual or potential conflicts of interest for LEI in performing the contractual obligations contemplated in this RFP. LEI is not currently working for a utility and/or investor in utilities operating in Louisiana, or any of their subsidiaries. To our knowledge, we are not advising, nor have a financial interest in, any potential bidders in a future competitive procurement for major resources in Louisiana.

If you have any follow-up requests or questions with respect to this submission, please do not hesitate to reach out to me at the contact information below.

Sincerely,

Marie N. Fagan, PhD  
Chief Economist  
T: (617)-933-7205,  
E: [marie@londoneconomics.com](mailto:marie@londoneconomics.com)

# Proposal responding to RFP 25-13 to assist the Louisiana Public Service Commission with forthcoming IRP Process

prepared for the Louisiana Public Service Commission by London Economics International LLC

November 21, 2025



*London Economics International LLC ("LEI") is pleased to submit this proposal to the Louisiana Public Service Commission ("LPSC" or "the Commission") to serve as the outside independent technical consultant in the process related to the Integrated Resource Planning of Cleco Power LLC, Entergy Louisiana, LLC, and Southwestern Electric Power Company.*

*LEI is a leading energy consulting firm that has advised regulators and utilities on tariffs and ratemaking. The firm possesses over 20 years of experience advising regulators, electric and natural gas utilities, private firms, and specific customer classes across the United States and Canada as well as among international jurisdictions. LEI has worked with a variety of regulators including the LPSC and has experience testifying on behalf of public agencies on ratemaking matters.*

## Table of contents

<b>1</b>	<b>BIDDER INFORMATION .....</b>	<b>4</b>
1.1	BACKGROUND AND STAFFING .....	5
1.2	BRIEF BIOS OF KEY STAFF ASSIGNED TO THE PROJECT .....	5
<b>2</b>	<b>QUALIFICATIONS AND EXPERIENCE .....</b>	<b>7</b>
2.1	UNDERSTANDING OF THE ENGAGEMENT .....	7
2.1.1	Familiarity with LPSC General Orders and minimum RFP requirements .....	7
2.2	SELECTED EXPERIENCE .....	11
2.2.1	Regulated utility issues: integrated resource planning, revenue requirements, cost of service, cost of capital analysis, tariff design .....	11
2.2.2	Utility management and prudency audits .....	14
2.2.3	MISO region experience .....	16
2.2.4	Expert witness experience .....	17
<b>3</b>	<b>PROPOSED PLAN OF ACTION .....</b>	<b>19</b>
3.1	TASK DESCRIPTION .....	19
3.1.1	Task 1: Review and examine filing and pre-filed direct testimony .....	19
3.1.2	Task 2: Assist in drafting, reviewing, and responding to discovery .....	20
3.1.3	Task 3: Assist in preparing direct and cross-answering testimony .....	20
3.1.4	Task 4: Aid in drafting pleading and motions .....	20
3.1.5	Task 5: Appear at hearings, open meetings, and participate in depositions if needed .....	21
3.1.6	Task 6: Assist with trial preparations and cross examination of witnesses .....	21
3.1.7	Task 7: Testify before an administrative law judge .....	21
3.1.8	Task 8: Participate in/conduct informal meetings with parties and commissioners .....	21
<b>4</b>	<b>TIMELINE AND BUDGET .....</b>	<b>22</b>
4.1	TIMELINE .....	22

*London Economics International is US-owned and operated*

4.2	PROFESSIONAL FEE BUDGET (NOT-TO-EXCEED) .....	22
4.3	EXPENSE BUDGET .....	22
4.4	TOTAL BUDGET .....	23
5	CONFLICT OF INTEREST .....	24
6	RESUMES OF KEY STAFF ASSIGNED TO THE PROJECT .....	25
6.1	MARIE N. FAGAN, PHD.....	26
6.2	BARBARA PORTO .....	51
6.3	SANDY (XINYI) CHEN .....	61

## Table of figures

FIGURE 1. SELECTED LEI CLIENTS THROUGHOUT THE WORLD.....	4
FIGURE 2. PROPOSED LEI TEAM ORGANIZATION CHART.....	5
FIGURE 3. MAJOR TASKS .....	19
FIGURE 4. PROFESSIONAL FEE BUDGET PER IRP DOCKET.....	22
FIGURE 5. LEI'S PROFESSIONAL FEE RATES.....	22
FIGURE 6. INDICATIVE TRAVEL COSTS PER IRP DOCKET.....	23



## 1.1 Background and staffing

LEI is extremely well-qualified to serve as a technical consultant to the LPSC. As described in detail in Section 2, LEI has broad experience in rate and tariff design, including analytical and audit capabilities. LEI understands the regional power market in the Midcontinent Independent System Operator (“MISO”) region, producing semi-annual market outlooks based on LEI’s detailed production simulation model of MISO. LEI understands the perspective and objectives of state regulators, having worked with many regulators. The firm has experience testifying on a variety of issues related to rate design, competitive markets, and long-term planning.

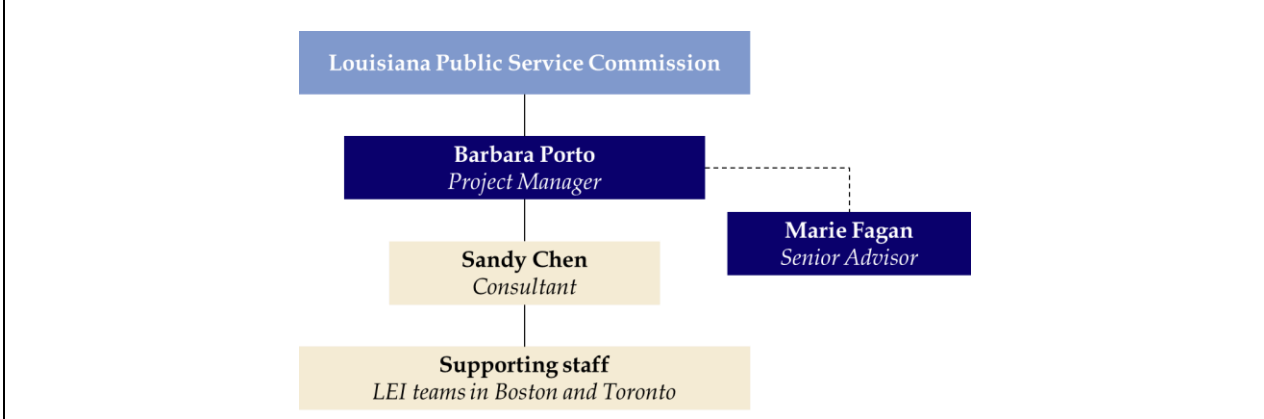
Based on the requirements of the engagement, LEI has gathered a select team of professionals with the required qualifications to assist the LPSC. The team possesses considerable independent assessment expertise, analytical and technical capabilities, and strong understanding of power markets, including MISO.

There will be three key personnel assigned to this project. Additional staff members and resources will be available on an as-needed basis. Key staff members assigned are as follows:

- *Marie Fagan, Chief Economist*
- *Barbara Porto, Senior Consultant*
- *Sandy Chen, Consultant*

*Barbara Porto* will have overall responsibility for the project and will act as project manager. *Marie Fagan* will serve as senior advisor and testifying expert. *Sandy Chen* will serve as a core team member. In addition, LEI staff in Boston and Toronto will provide additional support as needed.

**Figure 2. Proposed LEI team organization chart**



## 1.2 Brief bios of key staff assigned to the project

**Marie Fagan**, Chief Economist at LEI, will serve as a **senior advisor** for this engagement, and **expert witness**. With over 30 years of experience in research and consulting for the energy sector, Marie’s career has spanned international upstream and downstream oil and gas, global coal,

*London Economics International is US-owned and operated*

North American gas markets, and North American power markets. She has advised C-suite industry clients, buy-side and sell-side financial clients, as well as legislators and regulators. For state agencies, she has served as an expert witness and managed lengthy, high profile projects. She has led LEI projects for the LPSC, including assisting the Commission in with the 2021 integrated resource planning ("IRP") process of Cleco Power, ELL, and SWEPCO – Docket Nos: I-36175, I-36181, and I-36242, respectively.

**Barbara Porto**, Senior Consultant at LEI, will serve as the **project manager** for this engagement. She supports LEI's technical engagements with regulators, utilities, and private equity firms on issues regarding market design, project evaluation, wholesale price analysis, utility management/performance auditing, and regulatory engagements. Barbara manages many of LEI's audit engagements and has worked on many LEI projects for the LPSC.

**Sandy Chen** is a Consultant at LEI. She has applied her analytical and research skills to a variety of projects, ranging from market analysis, regulatory and ratemaking reviews, and quantitative modeling.

## **2 Qualifications and experience**

This section outlines LEI's understanding of the engagement and selected relevant experience.

### **2.1 Understanding of the engagement**

LEI understands that Cleco Power LLC ("Cleco"), Entergy Louisiana LLC ("ELL"), and Southwestern Electric Power Company ("SWEPCO") are filing requests to initiate their 2025 IRP processes. Specifically, the following dockets were opened:

- **Cleco:** LPSC Docket I-37765. Notice of this proceeding was published in the LPSC's Official Bulletin Number 1362, dated November 7, 2025.
- **ELL:** LPSC Docket I-37764. Notice of this proceeding was published in the LPSC's Official Bulletin Number 1362, dated November 7, 2025.
- **SWEPCO:** correspondence to initiate its 2025 is expected in December 2025.

The services of an outside independent technical consultant are sought to provide the Staff of the Commission with advice and counsel during the course of 24 months of each IRP process.

The scope of representation as described in the RFP must include, but is not limited to:

- assisting the Staff in holding technical conferences;
- the filing, pre-filed direct testimony, and accompanying support;
- assisting in drafting, reviewing, and responding to discovery;
- assisting in preparing direct and cross-answering testimony;
- aiding in drafting pleading and motions;
- appearing at hearings and open meetings;
- assisting with trial preparations, including assistance with drafting cross examination of witnesses;
- testifying before an administrative law judge; and
- participating in/conducting informal meetings with parties and the Commission Staff as necessary.

#### **2.1.1 Familiarity with LPSC General Orders and minimum RFP requirements**

LEI has working knowledge of LPSC's general orders and is familiar with all the minimum requirements listed in the RFP:

*1) The Commission's IRP Rules - General Order (Corrected) dated August 28, 2024 (Docket No. R-36262) regarding electric utilities filing Integrated Resource Plans.*

This General Order amends and supersedes the previous 2012 rules (Docket No. R-30021) to establish a unified planning process for electric utilities operating in Louisiana, explicitly removing the prior exemption for electric cooperatives. The rules are designed to establish the process to develop long-term resource plans to meet load requirements, including both supply and demand resources, while now explicitly mandating the consideration of transmission needs. These rules are intended to be flexible enough to allow utilities to develop plans that meet their

specific needs and circumstances, while also being consistent with the Commission's Market Based Mechanism Order and the 1983 General Order.

*2) The Commission's Rules and Orders pertaining to the IRP process as it relates to the acquisition of power supply resources, including, but not limited to, the Commission's Market Based Mechanisms Order and its 1983 General Order.*

The Commission's Market Based Mechanism Order (approved in 2002, subsequently amended a number of times), requires jurisdictional utilities to employ market-based mechanisms to support the acquisition (or purchase power agreements) of generation assets to serve Louisiana retail load. The results and analysis used to implement such mechanisms form the part of the justification as required under the 1983 General Order.

The Commission's General Order dated September 30, 1983 ("1983 Order"), as amended by the Commission's Order No. R-30517, dated October 29, 2008, establishes the procedures and requirements to issue the certificate of public convenience and necessity for construction of generating assets by jurisdictional utilities or other long-term resource procurements.

*3) Policies related to Energy Efficiency and Distributed Generation and their applicability to resource planning.*

The Commission's General Order of August 28, 2025 (Docket R-31106) formally concluded the Quick Start phase and adopted the Louisiana Energy Efficiency Program ("LEEP") Rules for jurisdictional electric and gas utilities. These permanent rules mandate the implementation of comprehensive energy efficiency programs starting January 1, 2026, establishing a budget cap of 1% of annual revenues, strict industrial opt-out criteria (5 MW aggregate demand), and a Lost Contribution to Fixed Costs ("LCFC") recovery mechanism.

Regarding load management, the Commission established the regulatory framework through General Order R-35136 (May 26, 2021), approving the Demand Response Rules. Utilities are currently operationalizing these rules through active pilots and procurements, such as SWEPCO's Supplemental Reserve Demand Response Pilot (effective January 2025) and ELL's 2025 Request for Proposals for a demand response portfolio.

The Commission's General Order (corrected) of Sep 19, 2019 (Docket R-33929) approved the Distributed Generation Rule, establishing the eligibility requirements, cost recovery mechanism, and mandates the utilities to provide open, fair and non-discriminatory access to eligible distributed generation resources.

*4) Policies related to Transmission and their applicability to resource planning.*

The resource planning criteria specifies system level optimization of all resources, including supply, demand and transmission options. The IRP must include the utility's current transmission plan, and meet the reliability criteria of the Regional Transmission Organization.



5) *Principles associated with resource acquisition, including but not limited to whether or not a particular resource meets the utility's need for power and whether the considered resources are able to meet those needs.*

The primary principles of acquiring resources are laid in the 1983 General Order - justification required for the certificate of public convenience and necessity, which has to be satisfied with the analysis utilized for market-based mechanism (2002 Market Based Mechanism Order).

6) *Whether or not resource will provide reliable services at the lowest reasonable cost.*

The Commission's IRP Rules - General Order (Corrected) dated August 28, 2024 (Docket No. R-36262) specify the following conditions:

- **Section 6 Part A: System Reliability Assessment.** The first step in the IRP analysis focuses on reliability. Under the new rules, the utility shall determine the reliability of its system, which may now be based on the rules and requirements of the Regional Transmission Organization (e.g., MISO) that the utility is part of, or based on a standalone system reliability assessment (typically using the one day in 10 years Loss of Load Probability criterion);
- **Section 6 Part F: Optimization Analysis.** Optimization analysis requires selecting resources that minimize costs while meeting all operating constraints, which explicitly includes reliability and the accounting of transmission needs.

7) *Resource planning methods to improve the efficiency and reliability of a utility's power supply operations and whether the utility is making use of any such methods.*

There are two aspects to improving the efficiency and reliability of the power supply operations: (i) improve and/or maintain the efficiency and reliability of the existing fleet, and (ii) add new generating that is more efficient and more reliable, either to meet the growing demand and/or replace the less efficient and less reliable capacity.

The operations of the existing fleet are monitored and reported as performance, reliability and efficiency parameters. The most commonly used report is the data provided to Generation Availability Data System of the North American Electric Reliability Corporation (NERC's GADS). These data provide a valuable tool in benchmarking operational performance and help identify areas of deficiency that require management's attention.

When developing the integrated resource planning, the Commission's IRP Rules - General Order (Corrected) dated August 28, 2024 (Docket No. R-36262) specify the following conditions:

- **Section 6 Part G: Sensitivity and Scenario Analysis.** Requires evaluation of the risk of unacceptable cost increases under certain conditions. This analysis must now consider transmission needs and regional constraints to ensure that the selected resource plan provides for a robust scenario that is not only economic but also operationally sound within the broader transmission grid.

*8) Public interest criteria for approval and monitoring of electric generating facility projects.*

The major public interest criteria when approving and monitoring of electric generating facility projects focus on:

- Whether impact on ratepayers is prudent and fair;
- How the proposed facility contributes to meeting the current and future demand needs;
- Whether the proponent is fit in terms of operational competence and financial capacity;
- Evaluation of the impact on other market participants – whether there is any adverse impact on the competitiveness;
- How it impacts the reliability and safety of the electric system.

*9) Rules and policies on cost recovery, including Cleco Power's formula rate plan or other rate plan in place during the course of the IRP.*

The latest Commission's Order No. U-36923 approved the Uncontested Proposed Stipulated Settlement regarding Cleco Power's Application for Implementation of Changes in Rates and Extension of the Formula Rate Plan (August 2024). The order establishes the "Third Amended and Restated Formula Rate Plan" effective July 1, 2024, through June 2027. The main feature of the Formula Rate Plan is an earnings bandwidth centered on a target return on equity ("ROE") of 9.70%. The plan includes a "no-sharing" deadband where the company retains 100% of earnings up to 10.30%. Earnings between 10.30% and 10.50% are subject to sharing between the company and customers, while all earnings exceeding 10.50% of ROE are refunded to customers.

*10) Rules and policies on cost recovery, including ELL's formula rate plan or other rate plan in place during the course of the IRP.*

The latest Commission's Order No. U-36959 approved the ELL's Application for Extension and Modification of Formula Rate Plan (September 13, 2024). ELL's rates have been set using the Formula Rate Plan since 1995. The latest order extended the FRP period for three years (covering Test Years 2023, 2024, and 2025). Under this extension, ELL's rates are subject to an ROE bandwidth of 9.15% to 10.15% (based on a midpoint of 9.65%). If earnings fall outside this bandwidth, rates are adjusted to reset the return to the midpoint. The order also increased the cap on the Distribution Recovery Mechanism ("DRM") to \$375 million annually.

*11) Rules and policies on cost recovery, including SWEPCO's formula rate plan or other rate plan in place during the course of the IRP.*

The latest Commission's Order No. U-35441 approved modifications to the SWEPCO's Formula Rate Plan (February 17, 2023). SWEPCO's rates include a Formula Rate Plan that prompts adjustment to customer rates based on the financial performance of the company, centered on an authorized ROE of 9.50%. The plan utilizes a bandwidth of 9.25% to 9.75%; if the company's earned ROE falls outside this range, rates are adjusted to restore earnings to the nearest edge of the bandwidth (the Lower or Upper Band). The plan also continues the use of specific riders to recover costs for wind generation assets and storm damages.

12) MISO tariffs, rules and planning processes.

LEI has a deep understanding of the MISO market. LEI monitors the market for ongoing client work and produces a semi-annual regional market update and wholesale price forecast for MISO and ten other North American power markets. A sample of relevant MISO experience including tariffs, rules and planning processes is shown in Section 2.2.3.

## **2.2 Selected experience**

This section provides a selection of projects relevant to the proposed engagement. The projects listed here are indicative of LEI's expertise and are not an exhaustive record of experience.

### **2.2.1 Regulated utility issues: integrated resource planning, revenue requirements, cost of service, cost of capital analysis, tariff design**

LEI has over a decade of experience in rate cases, as well as in rate design and tariff design in the United States and globally. Specific examples include recent experience in evaluating IRPs:

- ***Louisiana investor-owned utilities' IRPs:*** On behalf of the Louisiana Public Service Commission, LEI reviewed the IRP process and reports for Entergy Louisiana [Docket No. I-36181], Cleco Power [Docket No. I-36175], and SWEPCO [Docket No. I-36242] and served as the outside technical independent consultant. LEI reviewed and examined filings and pre-filed testimony; drafted, reviewed, and responded to discovery, and prepared the Staff Report and Recommendations. LEI appeared at technical conferences and hearings.
- ***Georgia Power Company IRP:*** LEI was engaged by a public interest group to serve as an independent technical consultant on selected issues related to the IRP of Georgia Power (Docket No. 56002 and 56003). LEI focus included examining whether Georgia Power's projections of load growth from data centers was reasonable and also provided an evaluation of Georgia Power's resource procurement process. LEI provided written and oral testimony on behalf of the client.
- ***Montana-Dakota Utilities ("MDU") rate case:*** LEI was engaged by the North Dakota Public Service Commission as the outside independent technical consultant supporting the Commission's ratepayer advocacy staff in a cost-of-service rate case (Case No. PU-22-194). LEI examined key components of the rate case, which included the depreciation study, tax rates, environmental upgrades, transmission investment, the ROE/common equity ratio, cost allocation, and amortization of early retirement of coal plants.
- ***Rate case for Massachusetts utility:*** LEI was hired to advise a gas utility company in Massachusetts on their performance-based distribution ratemaking filing. LEI performed a total factor productivity study and an econometric benchmarking analysis of utility performance. The reports were used by counsel to develop the company's strategy for the rate filing and were filed as testimony. LEI prepared direct written testimony, delivered oral testimony, developed interrogatory requests, responded to interrogatories by opposing counsel, and prepared rebuttal testimony. [Massachusetts DPU Docket No. 19-120].

- **Rate design for Kansas:** LEI was selected by the Kansas Legislative Coordinating Council (“LCC”) to perform a study of the retail rates of Kansas public electric utilities. The purpose of the study was to inform electric sector policies and result in competitive electric rates and reliable electric service in Kansas. Part of the study focused on exploring options for retail electricity tariffs.
- **Comparison of rates for retail consumers:** LEI was retained by a power industry advocacy group to review rates charged to final consumers across Canada and identify distortions in rate design across provinces. LEI performed modeling to account for distortions and developed appropriate calculations to accurately compare rates across jurisdictions.
- **Rate impact study:** LEI was engaged by an industry association to perform a study of the impact of electricity rates on Ontario’s manufacturing sector. The scope of work consisted of a review of Ontario industrial electricity rates and rate designs; assessment of competitive electricity rate levels; development of options to change rates in a manner consistent with rate setting principles and beneficial to industrial consumers and the Province; quantification of economic benefits from appropriate rate adjustments; and consultation with industry and government officials and experts.
- **Management of rate case filing:** LEI was retained by the largest electric utility company in Malaysia to provide project management services for the client’s performance-based regulation (“PBR”) submission. LEI’s scope of work consisted of several tasks: proposing the policy and governance framework for the PBR submission; providing a detailed project plan; assessing the regulatory requirement model; ensuring accurate and timely delivery of workshops; and reviewing the filing before submission.
- **Rulemaking to study renewable energy tariff, aka “green tariff” options:** LEI supported the Louisiana Public Service Commission (“LPSC”) in Docket No. R-35423. LEI provided framing questions for stakeholder feedback on green tariff options, evaluated stakeholder responses, provided in-depth case studies of green tariffs in other US jurisdictions, and provided other consultatory services for the Commission.
- **Tariff review:** LEI was engaged by the Argentine regulatory authority to conduct a tariff review of Edenor, a large utility. The LEI-led consortium advised the regulator on international best-practice design of tariffs, proposed a tariff setting methodology, provided technical assistance in the analysis of information presented by Edenor, proposed tariffs, and assisted the regulator during public hearings.
- **Tariff design:** LEI was commissioned to support the Saudi Arabian power regulator in setting an electricity tariff. The work entailed data collection, assessment of costs of generation, transmission, and distribution, development of appropriate tariff setting methodologies, analysis of possible incentive mechanisms, drafting and creating regulatory tools, and helping to create the tariff review unit.
- **Development of tariff impact model:** LEI was engaged by a private client to provide expert services in connection with the motion of the Financial Management and Oversight Board of Puerto Rico, as representative of the Puerto Rico Electric Power Authority (“PREPA”), and the Puerto Rico Fiscal Agency and Financial Advisory Authority for

approval of a settlement with PREPA's bondholders in PREPA's PROMESA Title III case. LEI modelled the tariff impact of the debt restructuring proposal on retail tariffs.

- ***Update and review of revenue requirements model:*** LEI advised and assisted Malaysia's national electric utility, TNB in developing and implementing a comprehensive project plan on its Incentive-based Ratemaking ("IBR") Regulatory Period 2 ("RP2") submission. LEI was responsible for updating and reviewing the revenue requirement model, and also developed a quantitative analysis of the operating expenditure and capital expenditure efficiency carryover mechanism.
- ***Impact of solar net metering on various customer classes:*** LEI calculated how the current net metering regime in Malaysia impacts different classes of customers (owing to a tariff design that is largely volumetric) and modelled how changing to a more cost reflective tariff with higher fixed charges and lower volumetric charges would result in less unintended cross subsidy between customer classes.
- ***Outlook for customer rates:*** LEI was retained by the Indiana Chamber of Commerce Foundation ("ICCF") to perform a study of Indiana's Energy Policy. As part of the study, LEI forecasted the blended electricity rates of investor-owned utilities ("IOUs") in Indiana, which included a forecast of wholesale electricity prices, capacity prices, rate base capacity charges, transmission rates, distribution rates, and other rate riders.
- ***Evaluation of impact on revenue requirements of potential public ownership of an electric utility:*** For the Maine Public Utilities Commission, LEI analyzed the impact of a directive called for the creation of a consumer-owned public utility called the Maine Power Delivery Authority ("MPDA"). This Authority would acquire, and subsequently operate, the transmission and distribution (T&D") assets owned and operated by the two Maine investor-owned utilities ("IOUs"). LEI's analysis was both qualitative and quantitative. The quantitative analysis involved a projection of T&D rate impacts on Maine electric consumers by evaluating the direction and magnitude of potential changes in the annual revenue requirements over time (2020-2050), under a scenario where the IOUs continue to exist and operate their assets (the "Status Quo" Scenario) versus a scenario where the MPDA is formed, acquires the T&D assets of the IOUs, and oversees the operation of the utility business (the "MPDA Scenario").
- ***Cost of service study for cost allocation:*** LEI was retained to review the Alberta Energy System Operator ("AESO") 2018 Tariff Application with specific focus on the allocation of transmission costs using a 12-CP allocator as well as to confirm the accurate application of the AESO's cost of service methodology in its filed cost of service model.
- ***Cost of capital parameters review:*** LEI was retained by the Ontario Energy Board ("OEB") to provide updates on the macroeconomic conditions of the utility sector in Ontario. LEI provided recommendations on whether the cost of capital policy and/or methodologies for calculating and updating the parameters may warrant review due to structural changes in the sector. LEI also provided variance analysis/trend analysis of cost of capital parameters, including the return on equity and deemed long-term and short-term debt rates based on movements of relevant economic indicators.

- **Cost of capital and risk factors:** LEI was engaged by Ontario Power Generation (“OPG”) to support senior management through regulatory processes related to performance-based rates. LEI prepared a discussion paper on incentive regulation mechanisms (“IRM”) currently in place in Ontario for electricity and natural gas distribution utilities and presented it at a technical workshop at the OEB. LEI also provided expert testimony regarding cost of capital and risk factors associated with OPG’s prescribed assets, as well as creating a risk-return continuum on which power sector assets could be placed.
- **Cost of capital opinion:** LEI was retained by a Canadian power utility to assess costs and benefits associated with output from coal fired power stations in Alberta. This engagement involved considering only information known as of a given historical year, to be used in a tax litigation case. LEI created pro forma valuation of contracts as of the given year, including forecast costs and revenues, and rendered an opinion on the appropriate cost of capital to be used.
- **Cost of capital for Hong Kong rate regime:** LEI was retained by the Hong Kong Special Administrative Region government to assess certain aspects of the Hong Kong regulatory regime for electricity, such as cost of capital, rate base calculations, efficiency incentives, and fuel cost pass through mechanisms.
- **Cost of capital and optimal capital structure:** LEI advised Jordan's power regulator on the weighted average cost of capital and optimal capital structure for the country’s three electric distribution companies. The recommended optimal capital structure was consistent with targeted debt service and interest coverage ratios in line with the rating methodology for distribution companies from the global credit rating agencies. LEI's work also included identifying salient risk factors for the distribution companies, identifying appropriate local and international metrics and benchmarks, developing a usable cost of capital model, and providing training workshops for local staff.
- **Revenue requirement:** LEI was retained by a large Canadian vertically integrated utility to assist with the creation of a comprehensive set of data requests to be submitted by the client in OEB case EB-2015-0275, the IESO's 2016 revenue requirement submission. LEI researched matters relating to the revenue requirement submission and past IESO fee applications, analyzed the cost allocation study prepared for the IESO, and proposed a detailed list of interrogatory requests on behalf of the client.

## **2.2.2 Utility management and prudence audits**

LEI’s experience in utility management auditing provides LEI with hands-on familiarity with financial and management practices that provide the foundation for understanding utility costs.

- **Audit of fuel adjustment clause of Entergy Louisiana:** LEI was engaged by LPSC, Docket No. X-35523, to perform an audit of the Fuel Adjustment Clause filings of Entergy Louisiana. The audit involved detailed examination of monthly true-ups of incurred costs with billed costs; determining the appropriateness of interest rates applied to over-recovered or under-recovered costs; examination of the impact of deferred costs; reconciliation of expenses recorded in FERC Form 1 account categories (“as booked”) with expenses included in monthly fuel adjustment clause filings; the prudence and

reasonableness of costs incurred for oil, gas, coal, and nuclear fuel and transportation, and an assessment operating performance of utility generating assets.

- ***Audit of fuel adjustment clause of Cleco Power:*** LEI was engaged by LPSC, Docket No. X-35522, to perform an audit of the Fuel Adjustment Clause filings of Cleco Power. The audit involved detailed examination of monthly true-ups of incurred costs with billed costs; determining the appropriateness of interest rates applied to over-recovered or under-recovered costs; examination of the impact of deferred costs; reconciliation of expenses recorded in FERC Form 1 account categories (“as booked”) with expenses included in monthly fuel adjustment clause filings; the prudence and reasonableness of costs incurred for oil, gas, coal, and nuclear fuel and transportation, and an assessment operating performance of utility generating assets.
- ***Audit of price stabilization rider of Duke Energy:*** LEI was engaged by the Public Utility Commission of Ohio (“PUCO”) to perform an audit of the Price Stabilization Rider (“PSR”) of Duke Energy Ohio related to Duke’s purchase of energy from the Ohio Valley Electric Corporation (“OVEC”). Aspects of the audit included assessing the reasonableness and prudence of the disposition of energy and capacity in the PJM market of the energy provided by two coal plants, as well as plant performance, compliance with environmental requirements, and the prudence of fuel purchases. LEI also audited charges and true ups related to the company’s quarterly PSR filings.
- ***Audit of power purchase agreement (“PPA”) rider of AEP Ohio:*** LEI was engaged by the PUCO to perform an audit of the PPA Rider of AEP Ohio related to AEP’s purchase of energy from the Ohio Valley Electric Corporation (“OVEC”). Aspects of the audit included assessing the reasonableness and prudence of the disposition of energy and capacity in the PJM market of the energy provided by two coal plants, as well as plant performance, compliance with environmental requirements, and the prudence of fuel purchases. LEI also audited charges and true ups related to the company’s quarterly PPA filings.
- ***Audit of alternative energy tariff rider:*** LEI was engaged by the PUCO to perform a management/performance audit of the Alternative Energy Rider of AEP Ohio. LEI examined processes involved in procuring renewable energy credits (“RECs”) and solar renewable energy credits (“SRECs”). LEI worked closely with the financial auditor to ensure all relevant accounting categories were accurately assigned. LEI compared and benchmarked AEP Ohio RECs costs, SRECs costs, and other operational results against data from public sources. LEI modeled the impact on ratepayers.
- ***Management audits of Entergy Mississippi and Mississippi Power Company:*** LEI was engaged by the Mississippi Public Service Commission (“MPSC”) to perform a two-year audit of the management activities of Entergy Mississippi. LEI assessed the utility's practices for economic purchase and use of fuel and electric energy, evaluated fuel and energy contract terms, investigated the operations of the utility's coal and nuclear generation units, and reviewed the prudence of coal inventory levels and inventory control procedures. LEI also audited the prudence of MISO operations and overall plant operations. Following the two-year audit, the MPSC engaged LEI for another two years to perform a similar audit of Mississippi Power Company, the other major vertically

integrated utility in the state; following that two year-assignment, MPSC again engaged LEI for a two-year audit of Entergy Mississippi.

### **2.2.3 MISO region experience**

LEI closely monitors the MISO region for ongoing client work, and produces a semi-annual regional market update and wholesale price forecast for eleven North American power markets, including MISO. Client projects have included:

- ***MISO ARR/FTR:*** LEI was retained by MISO to assess its revenue requirements and financial transmission rights (“ARR/FTR”) markets. More specifically, LEI evaluated the overall efficiency of the ARR/FTR markets, assessed the impact of financial traders on the ARR/FTR markets, and identified any gaps and opportunities for improvement in the market design and administration.
- ***Costs/benefit analysis of Entergy joining an RTO:*** LEI was hired by the Public Utility Commission of Texas (“PUCT”) to provide a cost/benefit analysis of the decision by Entergy to join MISO. LEI provided quantitative and qualitative analyses of specific costs/benefits attributable to Entergy Texas, Inc. (“ETI”) and its customers following membership of MISO compared with membership of SPP.
- ***Due diligence for a potential asset acquisition in MISO:*** LEI was engaged to assist in due diligence for a gas-fired generation asset. LEI reviewed contracts and performed financial analysis, with a specific focus on the assumed market value of capacity in the long term, and locational marginal prices for energy. Work involved reviewing documents in a virtual data room, and analysis related to drivers of gross margin for the asset: macroeconomics, weather fluctuations, fuel and electricity cost projections; and an overview of the gas and electricity market in the region.
- ***Revenue opportunity for gas-fired cogeneration units in MISO:*** LEI was engaged to inform the client of potential risks upon the termination of power purchase agreements (“PPAs”). LEI simulated MISO’s energy and capacity markets and derived forecasts of wholesale energy prices and capacity prices relevant to the units’ geographic location.
- ***Simulation-based modeling exercise to determine the potential revenues for the proposed transmission project wheeling power from western MISO to eastern MISO (and eventually PJM):*** LEI evaluated both the revenue opportunities to the investors (e.g., private benefits of the line based on market price differences and the market value of the transmission) as well as social benefits to the MISO system (i.e., wholesale price reductions and capacity market price differences); and evaluated the incremental value of the business strategy of selling the energy (and capacity) out of East MISO to third parties who will serve customers ultimately in PJM.
- ***Expert testimony in response to supplemental notice of public rulemaking (“NOPR”) on RTO incentives:*** LEI was retained by counsel to the MISO transmission owners to prepare a cost-benefit evaluation of FERC’s proposed policy changes with respect to the RTO ROE adder. LEI’s reports were submitted as evidence at FERC. [FERC Docket No. RM20-10-000]



- ***Review of transmission investment in multi-state RTOs:*** LEI was retained by a Midwest utility to examine transmission investment plans in MISO and other RTOs. LEI examined the major investment trends for transmission owners in MISO and other multi-state RTOs. The comparative analysis included a review of the planning process in each RTO, and investment trends (including outcomes emerging from FERC Order 1000).

#### **2.2.4 Expert witness experience**

LEI has performed dozens of engagements involving serving as an expert witness. The work listed below is a small sample.

- ***Reasonableness of utility financing request:*** On behalf of a Midwestern distribution cooperative, LEI reviewed a generation and transmission (“G&T”) cooperative’s petition before the Indiana Utility Regulatory Commission (“IURC”) for approval of \$300 million in financing for the next three years. LEI’s review included an assessment of the information provided by the applicant regarding the planned capital expenditures, as the IURC’s standard of review requires a determination that the application is in the public interest. LEI also assessed the various risks associated with the financing request, and how these risks could impact end-use customers, including the customers served by the distribution cooperative that retained LEI. LEI filed written testimony. [IURC Cause No. 45656]
- ***Stranded cost assessment:*** LEI was retained by Tipmont REMC (“Tipmont”) to prepare an independent expert assessment of potential stranded costs for its early termination of a wholesale power supply agreement with Wabash Valley Power Association (“WVPA”). LEI’s analysis was filed with FERC in February 2020; LEI testified in May 2021. [FERC Docket No. ER20-1041-000]
- ***Rate impact analysis and study of costs and benefits of municipalization:*** LEI was retained by the Maine Public Utility Commission to study proposed legislation that would involve municipalization of the state’s transmission and distribution networks. LEI submitted its expert report for the Legislature on February 15, 2020, and testified before the Joint Standing Committee on Energy, Utilities and Technology on February 26, 2020. [MPUC Docket 2019-00280]
- ***Expert witness in a performance-based ratemaking case for a gas LDC:*** LEI was retained in early 2019 to conduct Total Factor Productivity and Benchmarking analyses for the US gas distribution industry and provide expert technical advice to a gas utility company in Massachusetts; LEI’s analysis and expert testimony was submitted in anticipation of a performance-based distribution ratemaking application in late 2019; LEI testified before the Massachusetts DPU in June 2020. [DPU Docket 19-120]
- ***Independent expert assessing role of Enbridge Line 3 for Minnesota:*** LEI was engaged as the independent market expert assisting the Minnesota Department of Commerce in evaluating the application of Enbridge Energy for a Certificate of Need for its Line 3 oil pipeline expansion project. LEI provided written testimony, responded to interrogatory requests, and provided written surrebuttal and oral testimony. [Docket No. PL-9/CN-14-916, OAH Docket No. 65-2500-32764]

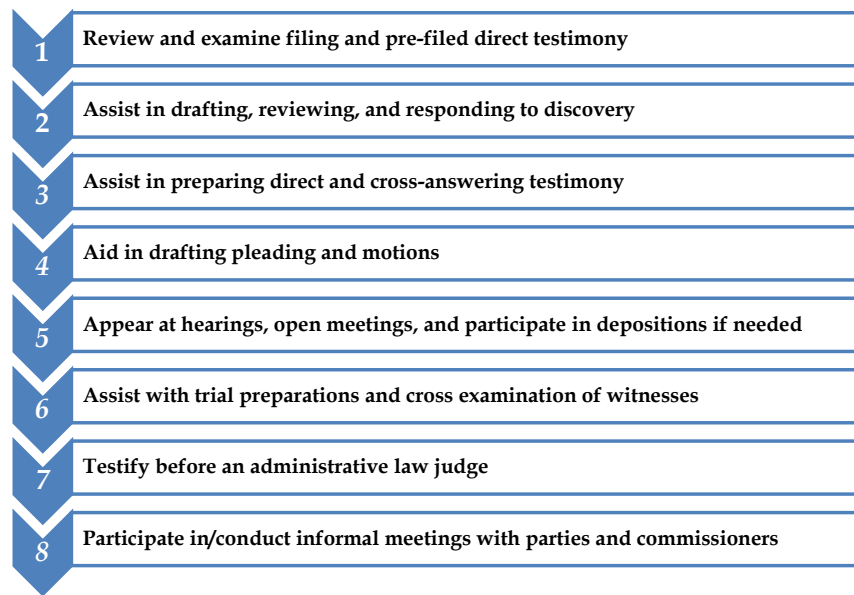
- ***Independent expert related to Maine Energy Cost Reduction Act:*** LEI was engaged by the State of Maine Public Utilities Commission (“MPUC”) to assist in evaluating options for expansion of natural gas supply into Maine. LEI authored pre-filing reports, responded to discovery from other parties, prepared discovery questions and cross-examined witnesses, reviewed testimony by other parties and provided assessments of the issues presented, and served as an expert witness in the proceedings. [MPUC Docket No. 2014-071] URL: <https://mpuc-cms.maine.gov/CQM.Public.WebUI/Common/CaseMaster.aspx?CaseNumber=2014-00071>
- ***Testimony related to transmission operating rules and curtailment protocols for interties into Alberta:*** Rules were promoted by Alberta Electricity System Operator (“AESO”) in order to support a fair, efficient and openly competitive power market. The LEI testimony was made in front of the Alberta Utilities Commission (“AUC”), on behalf of Morgan Stanley Capital Group (“MSCG”), a customer of the Montana-Alberta Transmission Line. LEI’s analysis considered commercial as well as operating protocols in deregulated power markets and how market rules incentivize new entry and produce dynamic efficiency gains. AUC Docket Number 1607958. URL: [http://www.auc.ab.ca/regulatory\\_documents/Pages/default.aspx](http://www.auc.ab.ca/regulatory_documents/Pages/default.aspx)
- ***ISO-New England tariff design:*** LEI submitted testimony on behalf of ISO-New England (“ISO-NE”) to the FERC to help defend the ISO’s self-funding tariff. LEI first defined the basic underlying economic principles for specifying the tariff and then undertook to show how the tariff should be applied to various system users. The engagement involved intensive financial modeling and frequent interaction with stakeholders. (2000) [ER01-316-000]
- ***Triennial market power analysis (southeast region):*** In support of a client’s application to renew market-based rate authorization under the jurisdiction of FERC, LEI performed Pivotal Suppliers Analysis and Market Share Analysis for the Entergy balancing authority area. (2011) [ER97-4281 et al.]
- ***Section 203 and 205 analysis in support of NRG’s acquisition of certain Dynegy assets in CAISO and ISO-NE:*** LEI was engaged to provide testimony in support of a proposed acquisition. LEI performed a Delivered Price Test (“DPT”) for the California Independent System Operator (“CAISO”) and ISO-NE energy markets, as well as a standalone Herfindahl-Hirschman Index (“HHI”) analysis for the capacity markets. (2010) [EC10-88-000]
- ***Analysis of generation market power under FERC’s indicative screens for market-based rate authorization:*** In support of the acquisition of a 21-MW solar photovoltaic (PV”) facility, LEI performed an updated market power analysis for acquirer’s affiliates in the California ISO which have been granted market-based rate authorization and prepared the related Section 203 filing. (2010) [ER10-204-000]

### 3 Proposed plan of action

Based on the RFP requirements and LEI's previous experience working on IRPs in Louisiana, LEI proposes several tasks to structure this engagement (see Figure 3). LEI's plan of action is discussed in detail below. This plan can be viewed as a starting point, as LEI understands that the LPSC and its Staff will have the right to determine how these tasks will be carried out.

In the course of this engagement, LEI senior team members will confer with the LPSC Staff in the form of periodic calls and by e-mail and will be available to attend meetings in Baton Rouge as needed. LEI senior staff will be available to attend or lead technical conferences, if any, and conduct informal meetings with parties as needed.

**Figure 3. Major tasks**



#### 3.1 Task description

Based on the RFP, LEI envisions 8 tasks with associated deliverables. These are summarized in Figure 3 above and discussed in detail below. All tasks will be performed separately for each IRP docket.

##### 3.1.1 Task 1: Review and examine filing and pre-filed direct testimony

LEI will examine Cleco's to-be-filed application and evidence seeking approval if its Integrated Resource Plan and consistency with General Orders noted in Section 2.1 above. LEI will review all Cleco's and intervenors' filings in this matter, or as required by Staff.

**Deliverable associated with Task 1**

The deliverable for Task 1 will be a memo containing LEI's initial findings about the implications of Cleco's proposed IRP and its suitability in the MISO context, and initial findings on other relevant issues which may become apparent.

**3.1.2 Task 2: Assist in drafting, reviewing, and responding to discovery**

As part of the hearing process, LEI will work with Staff to identify issues and/or sticking points in filings, to ensure consistency with General Orders, MISO rules, and other issues.

LEI will provide support for drafting, reviewing, and responding to any discovery and information requests ("IRs"). LEI's discovery questions for Cleco and other intervenors would include requests for all data, computations, and analysis for LEI to examine in detail, as well as all assumptions which may have been implied but not made explicit in witnesses' filings and reports. These may be propounded on interveners, experts, and Cleco.

**Deliverable associated with Task 2**

The deliverable(s) under Task 2 will be a set of written discovery questions related to initial filings and testimony, and follow-up discovery questions if needed, related to rebuttal and surrebuttal testimony.

**3.1.3 Task 3: Assist in preparing direct and cross-answering testimony**

As part of the hearing process, in addition to drafting the direct testimony, LEI will also review materials submitted by other parties and their expert witnesses, and in accordance, prepare information requests as needed. LEI is equipped to produce responses and rebuttal testimony addressing any issues stemming from the scope of representation specified in the RFP.

**Deliverable associated with Task 3**

The deliverable(s) under Task 3 will be written direct testimony, written rebuttal testimony, and written surrebuttal testimony as needed.

**3.1.4 Task 4: Aid in drafting pleading and motions**

LEI will provide support for drafting any pleading and motions seeking the commence of a new proceeding or ruling, as needed, based on the findings from the previous tasks.

**Deliverable associated with Task 4**

The deliverable(s) under Task 4 will be written memos as needed.

### **3.1.5 Task 5: Appear at hearings, open meetings, and participate in depositions if needed**

LEI has broad experience in attending and presiding over technical conferences, providing oral testimony, and examining witnesses.

#### **Deliverable associated with Task 5**

The deliverables under Task 6 are in-person attendance at scheduled hearings, open meetings, and participation in depositions by LEI's testifying witness, Marie Fagan. Dr. Fagan may be accompanied by other LEI staff as needed.

### **3.1.6 Task 6: Assist with trial preparations and cross examination of witnesses**

LEI has experience in developing comprehensive cross-examination questions in rate cases. In some instances, LEI has itself performed the cross examination; in others, LEI has provided background analysis and fundamental information, as well as cross-examination questions for use by counsel.

#### **Deliverable associated with Task 6**

The deliverable(s) under Task 6 will be a memo with cross-examination questions, organized by topic and theme.

### **3.1.7 Task 7: Testify before an administrative law judge**

LEI will testify before an administrative law judge as required.

#### **Deliverable associated with Task 7**

The deliverable(s) under Task 7 will be a written testimony.

### **3.1.8 Task 8: Participate in/conduct informal meetings with parties and commissioners**

LEI's team is committed to participate in and/or conduct informal meetings as needed.

#### **Deliverable associated with Task 8**

The deliverable(s) for Task 8 is participation in informal meetings in person, and/or conference calls, by LEI's testifying witness, Marie Fagan. Dr. Fagan may be accompanied by other LEI staff as needed.

## 4 Timeline and budget

LEI expects to have a kick-off meeting soon after the signing of the contract to adjust the proposed plan of action to meet all LPSC requirements and expectations.

### 4.1 Timeline

As indicated in the RFP, the time period required for the matter is estimated at approximately 24 months. LEI expects that the schedule and the deadlines will be finalized during the kick-off meeting, or shortly before or after. LEI commits to having the three key staff members noted in Section 1.2 available for the entire period of the project.

### 4.2 Professional fee budget (not-to-exceed)

LEI offers a total professional fee budget not to exceed **\$189,420** for the three IRP Dockets - \$63,140 for each IRP Docket (see Figure 4).

**Figure 4. Professional fee budget per IRP Docket**

Project task	Indicative work load in hours			Total
	Project Manager Barbara Porto	Project Advisor Marie Fagan	Project Researcher Sandy Chen	
Task 1: Review and examine filing and pre-filed direct testimony	3	10	10	23
Task 2: Assist in drafting, reviewing, and responding to discovery	5	16	16	37
Task 3: Assist in preparing direct and cross-answering testimony	5	10	10	25
Task 4: Aid in drafting pleading and motions	3	4	4	11
Task 5: Assist at hearings, open meetings, and technical conferences	3	4	4	11
Task 6: Assist with trial preparations and cross examination of witnesses	5	8	8	21
Task 7: Testifying before an administrative law judge	10	10	10	30
Task 8: Participate in/conduct informal meetings with parties and commissioners	8	8	8	24
	42	70	70	182
Hourly rates	\$360	\$470	\$2,880	
Amount per IRP Docket	\$15,120	\$32,900	\$15,120	\$63,140
Total for the three IRP Dockets	\$45,360	\$98,700	\$45,360	\$189,420

The proposed budget is based on LEI's professional fee rates (see Figure 5) and the estimated number of hours to be dedicated to each task.

**Figure 5. LEI's professional fee rates**

Staff	Project role	Company position	Hourly rate	Daily rate
Marie Fagan	Senior Advisor/Expert Witness	Chief Economist	\$ 470	\$ 3,760
Barbara Porto	Project Manager	Senior Consultant	\$ 360	\$ 2,880
Sandy Chen	Project Researcher	Consultant	\$ 260	\$ 2,080

### 4.3 Expense budget

LEI estimates that the additional cost for reasonable and customary reimbursable expenses, such as (but not limited to) printing, courier, and data acquisition fees, if any, will not exceed **\$3,000**. In addition, travel costs for each IRP Docket are estimated in Figure 6 below. LEI will comply

with all expense caps as outlined in the State of Louisiana Division of Administration Travel Policies and Procedures Memorandum. Accordingly, the travel expense budget will be approximately **\$8,646** for the three IRP dockets – \$2,882 per IRP docket.

**Figure 6. Indicative travel costs per IRP Docket**

Travel	# trips	# people	# nights	Total cost
Meetings with Commission and/or Staff	2	1	1	\$1,052
Preside over technical conference	1		1	\$526
Meetings with parties	2	1	2	\$1,304
<b>Total estimated costs</b>				<b>\$2,882</b>

#### **4.4 Total budget**

The total indicative budget including professional fees, travel, and other expenses therefore amounts to **\$199,926** for the three IRP Dockets – \$66,642 for each IRP Docket.

## **5 Conflict of interest**

LEI currently has no interest, direct or indirect, which would conflict with the performance of services under this contract and shall not employ, in the performance of this contract, any person having a conflict.



## **6 Resumes of key staff assigned to the project**

This page is intentionally left blank

## 6.1 Marie N. Fagan, PhD

*Chief Economist, London Economics International LLC*



---

### KEY QUALIFICATIONS:

Marie Fagan is the Chief Economist at London Economics International, LLC, based in Boston, Massachusetts. With 35 years of experience in research and consulting for the energy sector, Marie's career has spanned international upstream and downstream oil and gas, global coal, North American gas markets, and North American power markets. She has advised industry clients, financial clients, regulators, and public interest organizations. She serves as an expert witness in oil, gas, and electric power litigation and regulatory matters. Marie is experienced in the use of scenario analysis, an approach which helps clients identify potential turning points and arrive at decisions that are robust given the uncertainties inherent in any future set of market conditions.

At LEI, Marie's expertise across electricity markets and fuels provides integrated perspectives and supports sound strategic advice for clients. She has experience as a project manager for complex, multi-year engagements, including a two-year project for the Maine Public Utilities Commission, and a two-year project for the Mississippi Public Service Commission. She has deep experience in econometric analysis.

Marie leads LEI's engagements related to oil and natural gas market analysis. She led an engagement for the New Jersey Board of Public Utilities examining non-pipeline alternatives to meeting design day gas demand. She has directed gas pipeline modeling efforts based on a sophisticated network model, supporting outlooks for natural gas prices and basis, and analysis of flows on North American interstate pipelines. Projects have included serving as independent market expert for the Maine Public Utilities Commission, in the evaluation of the costs and benefits of new natural gas pipelines into New England, and independent market expert for the Minnesota Department of Commerce in the matter of the CN application of Enbridge Energy for the Enbridge Line 3 oil pipeline expansion.

Marie directs LEI's research of the Electric Reliability Council of Texas ("ERCOT") electric power market. Recent projects have included analysis of hourly real time and day-ahead energy prices in ERCOT for the week of February 14, 2021.

Marie leads LEI's utility management performance audit engagements and has been involved in performance-based ratemaking cases.

From 1996-2014, she was with Cambridge Energy Research Associates ("CERA," now part of IHS Markit). She served as an Associate, then Associate Director for CERA's Global Oil research practice, as Director for the North American Gas research practice; she founded the CERAVIEW Institutional Investor Service and co-founded CERA's Global Steam Coal service; she served as Senior Director for CERA's North American Electric Power service and of IHS CERA's Upstream

*London Economics International is US-owned and operated*

Strategy service. Before joining CERA, Marie served as an economist with the United States Energy Information Administration (“EIA”), conducting analysis and modeling supporting the Annual Energy Outlook (“AEO”), and conducting analysis of energy company financial performance.

Marie is the author of original research with publications in academic and industry journals. She holds a PhD in Economics from the American University in Washington, DC. She is a member of the Energy Bar Association, the American Economic Association, International Association for Energy Economics, and the Boston Economic Club. She is former Vice President of Business for the US Association for Energy Economics (“USAEE”) and is a former member of the USAEE Strategic Planning Committee. She serves as a referee for the *Energy Journal*, the flagship academic publication of the International Association for Energy Economics.

**EDUCATION:**

Institution	American University, Washington DC
Date:	1995
Degree(s) or Diploma(s) obtained:	PhD in Economics. Dissertation: “Measuring Cost and Efficiency in US Crude Oil Resource Development, 1977-1990: A Frontier Translog Cost Function Approach”

Institution	University of Connecticut
Date:	1984
Degree(s) or Diploma(s) obtained:	Bachelor of Science, Business Administration (Finance)

**EMPLOYMENT RECORD:**

Date:	2014-present
Location:	Boston, MA
Company:	<b>London Economics International LLC (“LEI”)</b>
Position:	Chief Economist (2020-present) Managing Consultant and Lead Economist (2016-2019) Managing Consultant (2014-2015)

Date:	2003-2014
Location:	Cambridge, MA
Company:	<b>IHS Markit (formerly Cambridge Energy Research Associates (“CERA”))</b>

*London Economics International is US-owned and operated*

Position:	<p>Senior director, Upstream Strategy Advisory service (2012-2014).</p> <ul style="list-style-type: none"> <li>Responsible for the re-vamp of research services and development of new research services focused on the needs of oil and gas exploration and production companies. Defined product architecture, defined deliverables, and generated research, as well as managed the delivery of research. Responsible for marketing plans and focus, conducting presentations to Board of Directors meetings and other C-suite client groups. Keynote speaker at IHS CERA events such as CERAWEEK and other industry events and conferences</li> </ul> <p>Senior director, North American Gas, Power, and Renewables group (2007-2011).</p> <ul style="list-style-type: none"> <li>Responsible for thought leadership, development, and delivery of research for IHS CERA's North American Electric Power Advisory Service and North American Gas and Power Scenarios Service. Led client engagements, as well as wrote and published research. Provided oversight and direction of the launch of a new research service, the IHS CERA Global Steam Coal Advisory Service</li> </ul> <p>Director/Senior director, CERAVIEW Institutional Investor Service (2004-2007)</p> <ul style="list-style-type: none"> <li>Created, launched, and directed IHS CERA's first research service encompassing the oil, gas, and power sectors to serve a targeted client community. Developed a new IHS CERA research publication, <i>Investors' Energy Monthly</i>, and served as publication's executive editor. In this role, won the IHS Circle of Excellence Award in 2005</li> </ul> <p>Director, North American Gas Advisory service (2003-2004)</p> <ul style="list-style-type: none"> <li>Responsible for rapid re-construction and turnaround of one of CERA's largest research advisory services. Contributed to and helped define the research agenda and was responsible for the editorial content and publication of major research and analytical reports related to gas infrastructure and markets in North America. Advised senior executive clients, including leading discussions of sensitive client-related issues.</li> </ul>
-----------	---

Date:	2001-2002
Location:	Boston, MA
Company:	<b>International Human Resources Development Corporation ("IHRDC")</b>
Position:	<p>Director, International Gas Program</p> <ul style="list-style-type: none"> <li>Developed and implemented management training programs for middle and senior energy company managers, designed interactive presentations and teaching materials, and served as instructor. Taught principles of project development and financial analysis of energy company operations.</li> </ul>

*London Economics International is US-owned and operated*

Date:	1996-2001
Location:	Cambridge, MA
Company:	<b>CERA</b>
Position:	<p>Associate director, Global Oil advisory service (1999-2001)</p> <ul style="list-style-type: none"> <li>• Authored original research reports, responsible for client presentations and the management, execution, and delivery of consulting projects.</li> </ul> <p>Associate, Global Oil advisory service (1996-1998)</p> <ul style="list-style-type: none"> <li>• Developed and maintained IHS CERA's expertise in exploration and production costs, technology, and financial factors affecting the upstream oil and gas industry.</li> </ul>

Date:	1994-1996
Location:	Washington, DC
Company:	<b>US Department of Energy, Energy Information Administration</b>
Position:	<p>Economist</p> <ul style="list-style-type: none"> <li>• Conducted financial analysis of upstream and integrated oil and gas companies; evaluated and implemented conceptual approaches to analysis of energy markets and market incentives and wrote and published original research reports.</li> </ul>

Date:	1989-1994
Location:	Vienna, Virginia
Company:	<b>Decision Analysis Corporation of Virginia (DAC)</b>
Position:	<p>Research associate/ Associate</p> <ul style="list-style-type: none"> <li>• Performed economic and econometric analysis, modeling, and forecasting to support the Energy Information Administration energy end-use models. Designed the National Energy Modeling System's Commercial Building Energy Demand Model; conducted financial analysis of energy companies.</li> </ul>

Date:	1988
Location:	Washington DC
Company:	<b>US Department of Energy, Office of Policy, Planning and Analysis</b>
Position:	<p>Intern</p> <ul style="list-style-type: none"> <li>• Researched waste-to-energy potential in the United States; constructed a database, developed econometric models, analyzed results, and produced written reports.</li> </ul>

**PROJECT EXPERIENCE:**

Date:	February 2025 – June 2025
Location:	US Southeast
Organization:	Public interest
Description:	<b>Integrated resource plan</b> LEI was engaged by a public interest group to serve as an independent technical consultant on selected issues related to the integrated resource plan (“IRP”) of Georgia Power filed in January 2025, in Docket No. 56002. LEI examined whether Georgia Power’s projections of load growth from data centers was reasonable. LEI also evaluated Georgia Power’s resource procurement documents with a view to assessing how the potential for stranded costs is addressed and mitigated. Marie served as project manager and lead author of written testimony.

Date:	March 2025
Location:	US Southeast
Organization:	Public interest
Description:	<b>Market power analysis</b> LEI was engaged by a public interest group to serve as an independent technical consultant related to the application for FERC approval for the purchase and sale of a generating asset in Alabama. LEI reviewed the methodology and results of a market power test performed by a consultant to the applicants. LEI examined the Horizontal Competitive Analysis Screen, including the Delivered Price Test (“DPT”) and the Herfindahl-Hirschmann Index (“HHI”). LEI provided a critical review of the methodology and assumptions underlying the market power test. Marie served as project manager and lead author of testimony filed with FERC (Docket No. EC-27-001).

Date:	December 2024 – July 2025
Location:	US Southeast
Organization:	Public interest
Description:	<b>Data center electric load growth</b> LEI was engaged to examine the potential growth of data center electricity demand in the Southeast United States and its impact on the need for new generation and firm transportation of natural gas. As part of the project, LEI performed a stand-alone in-depth analysis of the drivers of data center electricity demand projections at the US level, and examined potential biases inherent in US-wide projections of data center load growth. Marie served as project manager and lead author of reports.

Date:	July 2024 – July 2025
Location:	Oregon
Organization:	Investor-owned utility
Description:	<b>Tariff for data centers</b> LEI was engaged by a vertically integrated electric utility in Oregon to advise on designing a tariff rate suitable for large and fast-growing commercial and industrial

*London Economics International is US-owned and operated*

	customers such as data centers and microchip fabricators. LEI provided case studies of other jurisdictions which sought (either successfully or unsuccessfully) to adopt new rates and/or tariffs for similar customers. Based on the case studies and LEI's insight into effectiveness of various rate design features, LEI developed strategic options and recommendations for the executive team and Board of Directors. LEI provided support in front of the Oregon Public Utilities Commission, including participating in hearings and workshops. Marie served as project manager.
--	--

<i>Date:</i>	June 2024 – July 2025
<i>Location:</i>	Maine
<i>Organization:</i>	Maine Office of the Public Advocate
<i>Description:</i>	<p><b>Future of natural use in Maine</b></p> <p>LEI assisted the Office of the Public Advocate ("OPA") in addressing the future use of natural gas in Maine, including researching ways in which the regulatory system can help achieve Maine's statutory requirement to reduce greenhouse gas ("GHG") emissions. Tasks included i) evaluating strategies for reducing GHG emissions and reaching GHG reduction goals, ii) forecasting natural gas utility demand, iii) evaluating the consequences of alternative gas infrastructure investments, impacts on customers and rates, and environmental and health effects, iv) recommending how best to evaluate and apply State emissions goals to natural gas utilities, v) developing best practices or a common methodology to evaluate the GHG impact of commitments in new or expanded natural gas contracts/agreements, vi) preparing testimony in proceedings before the commission in proceedings involving the gas distribution utilities, and vii) preparing and presenting a summary report. LEI's reports were filed in Docket No. 2024-00174, and LEI provided written and oral testimony. LEI reports and testimony were also filed in Docket No. 2025-00143. Marie led the project.</p>

<i>Date:</i>	June 2024 – October 2024
<i>Location:</i>	New Jersey
<i>Organization:</i>	New Jersey Board of Public Utilities
<i>Description:</i>	<p><b>Future of natural gas utilities proceeding</b></p> <p>LEI supported the New Jersey Board of Public Utilities in their Future of Natural Gas Utilities proceeding, including researching ways to achieve New Jersey's statutory requirement to reduce greenhouse gas ("GHG") emissions under Executive Order 317. LEI examined options to reduce GHG emissions from the natural gas value chain (upstream, midstream, and end-use). LEI reviewed practices in other jurisdictions and gathered data and information to ensure informed stakeholder discussions and to populate the analytical framework. Marie led the project.</p>

<i>Date:</i>	September 2023 – October 2024
<i>Location:</i>	Maine
<i>Organization:</i>	Maine Office of the Public Advocate
<i>Description:</i>	<p><b>Examination of the costs and benefits of net energy billing</b></p> <p>LEI was engaged by the Maine OPA to assist in examining the costs and benefits of Maine's Net Energy Billing ("NEB") programs. LEI's methodology identified and</p>

*London Economics International is US-owned and operated*

	quantified direct additional ratepayer costs, indirect ratepayer costs, and cross-subsidies. LEI's final report, "Reducing the Cost of Solar Energy in Maine," included an analysis of the impact of the NEB kWh Credit program on the cost of standard offer service, and an estimate of the opportunity cost of the NEB programs. LEI's reports were filed in Docket No. 2024-00149, and LEI provided written and oral testimony. Marie led the project.
--	--

<i>Date:</i>	August 2023 – March 2024
<i>Location:</i>	Maine
<i>Organization:</i>	Maine Public Utilities Commission
<i>Description:</i>	<b>Utility renewable resource portfolio analysis</b> LEI was engaged by the Maine Public Utilities Commission to 1) identify options for selling the output from the portfolio of renewable energy resources procured by and under contract with two transmission and distribution ("T&D"); and 2) provide analysis of those options, including modeling of the various options for selling the output, to identify which options were most likely to maximize the value for Maine ratepayers. Marie led the project.

<i>Date:</i>	March 2023 – April 2024
<i>Location:</i>	Idaho/Oregon
<i>Organization:</i>	Idaho Power Company/Oregon Public Utilities Commission
<i>Description:</i>	<b>Independent evaluator for all-source RFP</b> LEI was engaged by the Oregon Public Utilities Commission as the Independent Evaluator ("IE") for the Idaho Power Company ("IPC") 2023 All-Source RFP. The project included a review and critique of IPC's RFP, performing independent initial shortlist evaluation and scoring, examination of IPC's models and approach to price and non-price scoring of bids (including IPC's proposed inclusion of imputed debt as an adder to PPA bids), examination and assessment of risks related to IPC's own benchmark bids, evaluation of modeling assumptions used by IPC in its market modeling for development of the optimal portfolio and final short list, and the filing of status reports and the final IE closing report. Marie served as Senior Advisor and expert witness. [Docket No. UM-2255].

<i>Date:</i>	July 2023 - January 2024
<i>Location:</i>	United States, PJM
<i>Company:</i>	Public Utilities Commission of Ohio
<i>Description:</i>	<b>Management performance and financial audit of large utility</b> LEI was engaged to perform a management performance and financial audit of AEP Ohio's Alternative Energy Rider ("AER") for the period 2018 - 2022. Marie led the project which required examining the terms of power purchase agreements ("PPAs") for wind and solar power, the cost of renewable energy credits ("RECs"); energy and capacity market prices; inventory strategies, and the accuracy of AEP Ohio's load forecasts. Marie recruited an accounting firm to perform the financial portion of the audit. [Case No. 23-0251-EL-RDR]

<i>Date:</i>	October 2022 – May 2023
<i>Location:</i>	North Dakota



*London Economics International is US-owned and operated*

<i>Organization:</i>	North Dakota Public Service Commission
<i>Description:</i>	<b>Montana-Dakota Utilities (“MDU”) rate case</b> LEI was engaged by the North Dakota Public Service Commission as the outside independent technical consultant supporting the Commission's ratepayer advocacy staff in a cost-of-service rate case involving MDU. LEI examined key components of the rate case, which included the depreciation study, tax rates, environmental upgrades, transmission investment, the ROE/common equity ratio, cost allocation, and amortization of early retirement of coal plants. LEI prepared data requests and provided written reports and oral testimony. Marie served as project manager and expert witness. [Case No. PU-22-194].

<i>Date:</i>	July 2022 – September 2022
<i>Location:</i>	Maine
<i>Organization:</i>	Maine Public Utilities Commission
<i>Description:</i>	<b>Investment incentives for electric distribution utility</b> Marie served as independent expert for the Maine PUC in its investigation of Central Maine Power Company (“CMP”) management issues and related ratemaking and performance incentive mechanisms. Ultimately, the Commission’s goal was to determine whether the rate plan to be proposed by CMP in a concurrent docket would be more suitable than the current cost-of-service rate plan under which CMP operates, given the parent company’s incentives to invest in CMP. Marie led the project, which included a literature review of utility investment incentives and of multi-national entities' ("MNE") incentives to invest in subsidiaries. The project also included detailed case studies of performance-based ratemaking regimes in other US jurisdictions, and the role and effectiveness of performance incentives in the regimes. [Docket No. 2022-00038, and Docket No. 2022-00152].

<i>Date:</i>	May 2022 – June 2022
<i>Location:</i>	ERCOT
<i>Organization:</i>	Private client (law firm)
<i>Description:</i>	<b>Analysis of fair market prices for natural gas</b> LEI provided economic analysis and independent expert advice related to natural gas market activities in Texas during and around February 2021 in conjunction with Brazos Electric Power Cooperative, Inc. bankruptcy case in Texas. LEI provided expert testimony report [Cause No. 21-03863]. Marie served as the project manager, natural gas expert, and a key witness.

<i>Date:</i>	April 2022
<i>Location:</i>	ERCOT/PJM/SPP
<i>Organization:</i>	Confidential client
<i>Description:</i>	<b>Regulatory and commercialization pathways for a renewable developer platform</b> LEI was engaged by a multinational energy company to support its due diligence of an acquisition of a 3000 MW+ portfolio of solar and wind development assets across PJM, ERCOT, and SPP. LEI performed a review of the state regulations and RTO markets for each asset, to determine evaluate the opportunities and risks around the

*London Economics International is US-owned and operated*

	commercialization paths for each asset. Marie led the analysis related to the ERCOT and SPP regions.
--	--

<i>Date:</i>	March 2022
<i>Location:</i>	Texas/ERCOT
<i>Organization:</i>	UT Austin Bureau of Economic Geology
<i>Description:</i>	<b>Expert contributor to study of gas distribution industry for Texas Railroad Commission</b> Following Storm Uri of February 2021, the Texas Railroad Commission was asked by the State of Texas to deliver an investigation of the value of underground storage for local gas distribution companies (“LDCs”), especially for coping with extreme weather conditions. The Bureau of Economic Geology at the University of Texas at Austin led the project. Marie provided insight into essential elements of the LDC gas supply procurement process, as well as best practices for winter supply security.

<i>Date:</i>	March 2022
<i>Location:</i>	Maine
<i>Organization:</i>	New England Aqua Ventus/Pine Tree Offshore Wind
<i>Description:</i>	<b>Economic impact of development of offshore wind in Maine</b> LEI was engaged by New England Aqua Ventus/Pine Tree Offshore Wind to evaluate the potential economic benefits to Maine of two scenarios for offshore wind project construction and operations based on floating offshore structures: NEAV’s 144-MW Research Array, and a commercial-scale buildout of 5,000 MW over a number of years. LEI utilized the IMPLAN economic model to estimate the economic impacts. Marie directed and led the project.

<i>Date:</i>	February 2022 – November 2024
<i>Location:</i>	Louisiana
<i>Organization:</i>	Louisiana Public Service Commission
<i>Description:</i>	<b>Review of integrated resource planning (“IRP”) process for three Louisiana utilities</b> LEI was engaged by Louisiana Public Service Commission, Docket No. I-36175 (Cleco Power), Docket No. I-36181 (Entergy Louisiana), and Docket No. I-36242 (SWEPCO), to assist to serve as the outside technical independent consultant in the process related to the IRP process for the three utilities. LEI reviewed and examined filings and pre-filed testimony; drafted, reviewed, and responded to discovery, and prepared direct and cross-answering testimony. LEI appeared at technical conferences and hearings and assisted with trial preparations as needed. Marie directed the three engagements and served as independent expert witness.

<i>Date:</i>	September 2021 – March 2022
<i>Location:</i>	ERCOT
<i>Organization:</i>	Private client
<i>Description:</i>	<b>February 2021 winter storm impacts on ERCOT natural gas production and prices</b> LEI developed and examined data for natural gas production at the basin level in Texas, flows on intra-state and inter-state pipelines, prices at supply and market hubs, and use of gas by electric power plants and other customers in the state. Marie served as senior advisor to the project team.

*London Economics International is US-owned and operated*

<i>Date:</i>	July 2021 - present
<i>Location:</i>	Louisiana
<i>Organization:</i>	Louisiana Public Service Commission
<i>Description:</i>	<p><b>Audit of fuel costs of Cleco Power associated with the February 2021 Winter Storm Event</b></p> <p>LEI was engaged by Louisiana Public Service Commission, Docket No. X-35990, to perform an audit of the Fuel Adjustment Clause ("FAC") filings of Cleco Power related to costs incurred during the February 2021 Winter Storm Event. Marie supervised and directed the audit. In addition to the scope of services typically provided in an FAC audit, LEI also examined actions and decisions of Cleco Power leading up to and during the Winter Storm Event.</p>

<i>Date:</i>	May 2021 – March 2022
<i>Location:</i>	Louisiana
<i>Organization:</i>	Louisiana Public Service Commission
<i>Description:</i>	<p><b>Evaluation of utility green pricing option</b></p> <p>LEI was engaged by Louisiana Public Service Commission, Docket No. U-35916, to serve as the technical consultant evaluating Entergy Louisiana LLC's application for authorization to implement a green pricing option, to be paid for by a Green Pricing Option ("GPO") or Large Volume Green Pricing Option ("LVGPO") rider, and related rate relief. LEI reviewed and examined filings and pre-filed testimony, assisted in drafting, reviewing, and responding to discovery, prepared testimony, and conducted other activities related to the matter.</p>

<i>Date:</i>	April 2021 – March 2022
<i>Location:</i>	ERCOT
<i>Organization:</i>	Private client
<i>Description:</i>	<p><b>February 2021 winter storm impacts on ERCOT energy prices</b></p> <p>For a law firm representing an ERCOT market participant, LEI conducted an analysis of the impact on hourly real time energy prices in ERCOT for the week of February 14, 2021. Marie served as co-author of report, filed in PUCT Project 51812, Item No. 207. <a href="https://interchange.puc.texas.gov/search/documents/?controlNumber=51812&amp;itemNumber=207">https://interchange.puc.texas.gov/search/documents/?controlNumber=51812&amp;itemNumber=207</a></p>

<i>Date:</i>	July 2021 – December 2021
<i>Location:</i>	Ohio
<i>Organization:</i>	Public Utilities Commission of Ohio
<i>Description:</i>	<p><b>Audit of Legacy Generation Resource ("LGR") Riders of Duke Energy, AEP Ohio, and AES Ohio</b></p> <p>LEI was engaged by the Public Utility Commission of Ohio, to perform audits of the LGR Riders for three major Ohio electric distribution utilities. The LGR Riders are the mechanisms for passing to customers the costs of a power purchase contract with the Ohio Valley Electric Corporation ("OVEC"). Aspects of the audit included assessing the</p>

*London Economics International is US-owned and operated*

	reasonableness and prudence of the disposition of energy and capacity in the PJM market of the energy provide by two coal plants owned by OVEC, as well as plant performance, compliance with environmental requirements, and the prudence of fuel purchases. LEI also audited charges and true ups related to the companies' filings. Marie supervised and directed the audits.
--	--

<i>Date:</i>	February 2021 - February 2022
<i>Location:</i>	New Jersey
<i>Organization:</i>	New Jersey Board of Public Utilities
<i>Description:</i>	<p><b>Natural gas capacity and non-pipeline alternatives</b></p> <p>LEI was engaged by the New Jersey Board of Public Utilities to examine current and future natural gas transmission capacity to serve demand from New Jersey's local gas distribution utilities (Docket No. GO19070846). The purpose of the engagement was to determine if capacity on pipelines and from non-pipeline sources would be sufficient to meet demand from firm customers through 2030. LEI examined the capacity and contracting status of pipelines serving New Jersey. LEI examined design day demand projections from the LDCs and estimated impacts of New Jersey's energy efficiency targets in the context of its Energy Master Plan and de-carbonization goals. LEI also looked at the role of third-party suppliers. LEI provided recommendations for addressing capacity issues. LEI also developed a playbook for identifying possible alternatives, including non-pipeline alternatives and new tariff mechanisms, for avoiding and/or responding to potential disruptions. Marie led the project.</p>

<i>Date:</i>	August 2020 - present
<i>Location:</i>	Louisiana
<i>Organization:</i>	Louisiana Public Service Commission
<i>Description:</i>	<p><b>Audit of fuel adjustment clause of Entergy Louisiana</b></p> <p>LEI was engaged by Louisiana Public Service Commission, Docket No. X-35523, to perform an audit of the Fuel Adjustment Clause filings of Entergy Louisiana. Marie supervised and directed the audit. The audit involved detailed examination of monthly true-ups of incurred costs with billed costs; the appropriate of interest rates as applied to over-recovered or under-recovered costs; examination of the impact of deferred costs; reconciliation of expenses recorded in FERC Form 1 account categories ("as booked") with expenses included in monthly fuel adjustment clause filings; the prudence and reasonableness of costs incurred for oil, gas, coal, and nuclear fuel and transportation, and an assessment operating performance of utility generating assets.</p>

<i>Date:</i>	July 2020 - present
<i>Location:</i>	Louisiana
<i>Organization:</i>	Louisiana Public Service Commission
<i>Description:</i>	<p><b>Audit of fuel adjustment clause of Cleco Power</b></p> <p>LEI was engaged by Louisiana Public Service Commission, Docket No. X-35522, to perform an audit of the Fuel Adjustment Clause filings of Cleco Power. Marie supervised and directed the audit. The audit involved detailed examination of monthly true-ups of incurred costs with billed costs; the appropriate of interest rates as applied to over-recovered or under-recovered costs; examination of the impact of deferred costs;</p>

*London Economics International is US-owned and operated*

	reconciliation of expenses recorded in FERC Form 1 account categories (“as booked”) with expenses included in monthly fuel adjustment clause filings; the prudence and reasonableness of costs incurred for oil, gas, coal, and lignite; and transportation; and an assessment operating performance of utility generating assets.
--	--

<i>Date:</i>	June 2020 – October 2020
<i>Location:</i>	Ohio
<i>Organization:</i>	Public Utilities Commission of Ohio
<i>Description:</i>	<b>Audit of PSR of Duke Energy</b> LEI was engaged by the Public Utility Commission of Ohio, to perform an audit of the Price Stabilization Rider (“PSR”) of Duke Energy Ohio related to Duke’s purchase of energy from the Ohio Valley Electric Corporation (“OVEC”) (PUCO Case No. 20-167-EL-RDR). Aspects of the audit included assessing the reasonableness and prudence of the disposition of energy and capacity in the PJM market of the energy provide by two coal plants, as well as plant performance, compliance with environmental requirements, and the prudence of fuel purchases. LEI also audited charges and true ups related to the company’s quarterly PSR filings. Marie supervised and directed the audit.

<i>Date:</i>	May 2020 – September 2020
<i>Location:</i>	Ohio
<i>Organization:</i>	Public Utilities Commission of Ohio
<i>Description:</i>	<b>Audit of PPA Rider of AEP Ohio</b> LEI was engaged by the Public Utility Commission of Ohio, to perform an audit of the PPA Rider of AEP Ohio related to AEP’s purchase of energy from the Ohio Valley Electric Corporation (“OVEC”) (PUCO Case No. 18-1004-EL-RDR). Aspects of the audit included assessing the reasonableness and prudence of the disposition of energy and capacity in the PJM market of the energy provide by two coal plants, as well as plant performance, compliance with environmental requirements, and the prudence of fuel purchases. LEI also audited charges and true ups related to the company’s quarterly PPA filings. Marie supervised and directed the audit.

<i>Date:</i>	April 2020 - May 2020
<i>Location:</i>	North Dakota
<i>Organization:</i>	Law firm
<i>Description:</i>	<b>Impacts of the potential shutdown of the Dakota Access pipeline (“DAPL”)</b> LEI was engaged by a law firm representing the plaintiff tribes to provide a Declaration in the matter of US District Court Case No. 1:16-cv-1534-JEB. Marie directed and led the research and prepared the Declaration as well as an in-depth report. The report covered issues including the long-term and near-term drivers of oil production in North Dakota, the drivers of global oil demand, the costs to transport oil by rail versus pipeline, and analysis of rail transport trends in the United States. She provided independent analysis as well as critiques of Declarations filed by other witnesses. Her declaration is available at: <a href="https://earthjustice.org/sites/default/files/files/3154-525_declarations-in-support-of-standing-rock.pdf">https://earthjustice.org/sites/default/files/files/3154-525_declarations-in-support-of-standing-rock.pdf</a>

<i>Date:</i>	February 2020 - present
<i>Location:</i>	Louisiana

*London Economics International is US-owned and operated*

<i>Organization:</i>	Louisiana Public Service Commission
<i>Description:</i>	<b>Rulemaking to study renewable energy tariff, aka “green tariff” options</b> Marie’s team supported the Louisiana Public Service Commission in Docket No. R-35423. LEI provided framing questions for stakeholder feedback on green tariff options, evaluated stakeholder responses, provided in-depth case studies of green tariffs in other US jurisdictions, and provided other consultatory services for the Commission.

<i>Date:</i>	January 2020 – June 2020
<i>Location:</i>	Massachusetts
<i>Company:</i>	Massachusetts Office of the Attorney General
<i>Description:</i>	<b>Application for firm transportation on a gas pipeline</b> The MA Attorney General's Office of Ratepayer Advocacy ("AGO") engaged LEI to examine the application of National Grid d/b/a Boston Gas for approval to execute a contract with Algonquin, for firm transportation (“FT”) on the Atlantic Bridge Project (DPU 19-132). Marie led the project which included examining National Grid’s projections of gas demand and its assumed resources to meet demand; examining the Assigned Precedent agreement for the FT as well as other documents; and providing a critique of the assumptions driving National Grid’s cost-benefit analysis. Marie reviewed briefs, developed interrogatory requests, and evaluated the responses to such requests.

<i>Date:</i>	November 2019
<i>Location:</i>	Japan
<i>Organization:</i>	Private equity investor
<i>Description:</i>	<b>Long-term outlook for Japan electricity sector</b> LEI was engaged to prepare a brief, fact-based report that would help support a view of wholesale electricity prices in Japan after 2040. Marie authored the report, which covered i) the structure of Japanese electric power industry, and ii) the status of de-regulation and environmental policy. Based on this, Marie developed two reasonable scenarios for wholesale prices based on two different paths for energy supply to 2040 and beyond.

<i>Date:</i>	October 2019 – November 2019
<i>Location:</i>	ERCOT
<i>Organization:</i>	European investor-owned utility
<i>Description:</i>	<b>Investment environment for transmission in ERCOT</b> LEI was engaged by a European utility to examine the investment environment for transmission in ERCOT. Marie’s team provided a detailed report covering agents and institutions, the regulatory and legal framework, remuneration of investment, and transmission planning.

<i>Date:</i>	July 2019 - August 2019
<i>Location:</i>	Alberta, British Columbia
<i>Organization:</i>	Counsel for natural gas producer
<i>Description:</i>	<b>Analysis of Western Canadian natural gas costs and production</b>

*London Economics International is US-owned and operated*

	LEI was retained by counsel to provide support in the matter of NOVA Gas Transmission Limited ("NGTL")'s application to the National Energy Board ("NEB"). LEI reviewed evidence and prepared testimony. Marie led analysis of the natural gas and natural gas liquids ("NGLs") market in Alberta and British Columbia, and the impact of a pipeline surcharge on producers of natural gas.
--	---

<i>Date:</i>	May 2019 – August 2020
<i>Location:</i>	Massachusetts
<i>Organization:</i>	Investor-owned gas distribution utility
<i>Description:</i>	<b>Econometric benchmarking analysis of gas utility performance for PBR</b> LEI was hired to be the advisor of a gas utility company in Massachusetts for their performance-based distribution ratemaking plan. Eversource hired LEI in relation to its NStar Gas distribution company, to support NStar Gas's rate filing for performance-based ratemaking. Marie led an econometric benchmarking analysis of utility performance and served as a testifying witness. The econometric analysis used a transcendental logarithmic cost function (a tried-and-tested methodology for providing empirical evidence in utility benchmarking cases) to help set expectations for further efficiency improvement and an appropriate stretch factor. The benchmarking report was used by counsel to develop the company's strategy for the rate filing. Marie prepared direct written testimony, delivered oral testimony, developed interrogatory requests, responded to interrogatories by opposing counsel, and prepared rebuttal testimony. DPU Docket No. 19-120.

<i>Date:</i>	June 2019- December 2019
<i>Location:</i>	Ontario
<i>Organization:</i>	Generating company
<i>Description:</i>	<b>Benchmarking generation utility performance</b> LEI was engaged to support a hydropower generating company in relation to its second-generation hydroelectric payment amounts price-cap application before the regulator. The project involved performing independent benchmarking analysis of OPG's regulated hydroelectric facilities. This project involved selecting an appropriate peer group, selection of appropriate metrics to be benchmarked, and model development. Marie created an econometric model to develop recommendations as to the appropriate stretch factor to apply. LEI also aided the company in public consultations and the regulatory process.

<i>Date:</i>	October 2018 – April 2018
<i>Location:</i>	United States, ISO-NE
<i>Company:</i>	Massachusetts Office of the Attorney General
<i>Description:</i>	<b>Winter fuel reliability/electric power market design</b> The MA Attorney General's Office of Ratepayer Advocacy ("AGO") engaged LEI to examine ISO-New England's proposals to address potential winter fuel security issues facing the electric power sector. Marie led the project, including developing an independent definition of the problem to be solved; developing solutions, identifying potential allies in the NEPOOL stakeholder community; analyzing other stakeholders' proposals; and working with the AGO in the stakeholder process. LEI developed an alternative proposal, a forward auction for stored energy reserves based on the financial

*London Economics International is US-owned and operated*

	concept of an American call option with a two-dimensional bid (the option premium and strike price).
--	--

<i>Date:</i>	February 2018 – December 2018
<i>Location:</i>	Global
<i>Company:</i>	Columbia University School of International and Public Affairs, Center on Global Energy Policy
<i>Description:</i>	<p><b>Econometric analysis of crude oil price and income elasticities of demand</b></p> <p>LEI was engaged by the Columbia University, Center for Global Energy Policy (“CGEP”) to conduct econometric analysis of global oil demand. Marie directed and managed the project, the foundation of which was a detailed econometric analysis of price and income elasticities of oil demand. Marie employed a variety of specifications of econometric models (including static and dynamic models, and symmetric and asymmetric models) and estimated separate models for crude oil, gasoline, and diesel demand. She used country-level data covering 40 years (1977-2016), aggregated into panel (pooled cross-section and time series) data sets for OECD, non-OECD, and oil-producing countries. Marie examined and reported the results of econometric tests covering time-series properties of the data (tests for integration and cointegration), performance of the log linear model specification as compared to an intrinsically non-linear specification, and the pool-ability of cross-sectional data.</p>

<i>Date:</i>	September 2018-December 2018
<i>Location:</i>	United States, ISO-NE
<i>Company:</i>	Maine Public Utilities Commission
<i>Description:</i>	<p><b>Avoided energy supply costs</b></p> <p>LEI was engaged to perform a critical review of the methodology and assumptions which underpinned other consultants’ analysis of avoided energy supply costs (“AESCS”). Marie led the gas market forecast, and the critical review of the other consultants’ gas price forecast. She also led a careful examination of the economic theory and econometric techniques used by the other consultants to estimate demand-induced price reduction effects (“DRIPE”). Owing to miss-specified models and/or unwarranted assumptions (such as a perfectly inelastic demand curve for natural gas in the long term) the other consultants’ DRIPE estimates were generally too high. [Docket No. 2018-00321]</p>

<i>Date:</i>	June 2018-December 2018
<i>Location:</i>	United States, PJM
<i>Company:</i>	Public Utilities Commission of Ohio
<i>Description:</i>	<p><b>Management performance and financial audit of large utility</b></p> <p>LEI was engaged to perform a management performance and financial audit of AEP Ohio’s Alternative Energy Rider (“AER”). Marie led the project which required examining the terms of power purchase agreements (“PPAs”) for wind and solar power, the cost of renewable energy credits (“RECs”); energy and capacity market prices; inventory strategies, and the accuracy of AEP Ohio’s load forecasts. Marie recruited a local Ohio accounting firm to perform the financial portion of the audit; she provided guidance (as</p>



*London Economics International is US-owned and operated*

	the firm had not previously audited a utility) and oversight of their work as well as the work of the LEI in-house team. [Docket No. 18-80-EL-RDR]
--	--

<i>Date:</i>	March 2018 - September 2018
<i>Location:</i>	United States, MISO, Michigan
<i>Company:</i>	NGO
<i>Description:</i>	<p><b>The role of Enbridge Line 5 in NGLs and crude oil transport in Michigan</b></p> <p>For a non-governmental organization ("NGO") Marie produced three white papers examining the current and future role of Enbridge Line 5 in Michigan related to three issues: propane supply in Michigan, transportation for crude oil producers in Michigan, and supply of crude oil to Michigan-area refineries. Marie's analysis of the propane market included a comparative static econometric analysis of the supply and demand from propane in Michigan, explained in non-technical language. The white papers were used by the client in discussions with the Governor of Michigan and other stakeholders</p>

<i>Date:</i>	July 2017-June 2018
<i>Location:</i>	United States, MISO, Minnesota
<i>Company:</i>	Minnesota Department of Commerce
<i>Description:</i>	<p><b>Role of Enbridge Line 3 in heavy and light crude oil supplies</b></p> <p>Marie served as independent market expert assisting the Minnesota Department of Commerce in evaluating the application of Enbridge Energy for a Certificate of Need for its Line 3 oil pipeline expansion project (Docket No. PL-9/CN-14-916, OAH Docket No. 65-2500-32764). Marie's analysis covered global and local trends in refined product demand and crude oil supply, refinery utilization rates and utilization of high-conversion refinery capacity in Petroleum Administration for Defense District ("PADD") 2 and in the local Minnesota region. Her analysis required detailed examination of the assumptions and methodology of an oil pipeline linear programming-based model, in order to assess another witness's testimony which relied on the model. Marie provided written testimony; responded to interrogatory requests, provided written surrebuttal, and oral testimony.</p>

<i>Date:</i>	June 2017-December 2018
<i>Location:</i>	United States, MISO, Mississippi
<i>Company:</i>	Mississippi Public Service Commission
<i>Description:</i>	<p><b>Management audit of large vertically integrated utility</b></p> <p>Marie led a management audit of the fuel (gas, coal, and nuclear) and energy procurement activities of Entergy Mississippi. Marie's team assessed fuel and energy contract terms, and reviewed the prudence of coal and nuclear fuel procurement and inventory practices. Marie's team also assessed management, organization, controls, strategies, and outcomes for the company's hourly MISO offers. The team investigated the operations of a nuclear power plant, and the financial implications of the utility's power purchase agreement for nuclear power. Marie appeared before the Commission to present and defend findings.</p>

<i>Date:</i>	November 2018 – February 2019
--------------	-------------------------------

*London Economics International is US-owned and operated*

<i>Location:</i>	WECC
<i>Company:</i>	PacifiCorp
<i>Description:</i>	<b>Independent evaluator (“IE”) for energy procurement</b> LEI was retained as an IE by PacifiCorp for its system-wide 2017 Solar RFP. Marie led the project, which included a review of PacifiCorp's Solar RFP, the facilitation and monitoring of communications between PacifiCorp and bidders, performing independent initial shortlist evaluation and scoring, and the filing of status reports and the final IE closing report.

<i>Date:</i>	April, May 2017
<i>Location:</i>	United States and Canada
<i>Company:</i>	Private client
<i>Description:</i>	<b>Review of investable energy sectors</b> For a private equity client, Marie led an extensive project reviewing a wide range of investable energy sectors in the United States and Canada. The sectors included: electricity generation (natural gas, wind, solar, hydro), AMI, distributed resources, demand response, retail energy, gas LDCs, gas storage, gas pipeline transportation, LNG-related infrastructure, vertically integrated utilities, electric distribution utilities, and water utilities. LEI assessed the investment potential of each sector for the next five years and proposed a methodology to screen and identify investment opportunities and execute on these opportunities.

<i>Date:</i>	March 2017
<i>Location:</i>	Alberta, Canada
<i>Company:</i>	Private client
<i>Description:</i>	<b>Analysis of capacity markets</b> LEI was engaged to provide global perspectives on the detailed mechanisms that make up capacity markets, so that eventual capacity market design in Alberta will be workable and efficient, with minimal unintended consequences. Marie led research and delivered a detailed report on market power mitigation mechanisms and their potential impacts on capacity market performance.

<i>Date:</i>	February 2017
<i>Location:</i>	North America
<i>Company:</i>	Provider of services to vehicle fleet industry
<i>Description:</i>	<b>Outlook for electrification of transportation</b> Marie developed scenario outlooks for electric vehicle (“EV”) market penetration in the United States; examined the role of electric utilities (and their emerging EV-related business models) as potential partners versus competitors to the downstream transportation industry; identified activities and strategic positioning of upstream and downstream industry participants; led discussion of implications of “electrification of transportation” for fleet service companies, convenience stores, and other downstream industry participants. Presented material to company’s partner advisory board.

<i>Date:</i>	December 2016
--------------	---------------

*London Economics International is US-owned and operated*

<i>Location:</i>	Alberta, Canada
<i>Company:</i>	Private client
<i>Description:</i>	<b>Analysis of capacity markets</b> To support Board-level understanding of the implications of potential capacity market designs in Alberta, Marie prepared a detailed review and comparison of capacity markets across international and North American jurisdictions. Report concluded “the devil is in the details” of capacity market design. Market design details with potentially large impacts on the client were resource eligibility definitions, price setting mechanism, demand curve design, performance requirements, and market power mitigation rules.

<i>Date:</i>	September 2016
<i>Location:</i>	Northeast United States
<i>Company:</i>	Private client
<i>Description:</i>	<b>Examination of solar business models</b> For a client performing due diligence related to a potential investment in business-to-business behind-the-meter solar in the Northeast United States, Marie led a project examining US federal and state incentives for solar adoption, and assessing business models used for targeting commercial, institutional, and industrial sectors. For each business model, LEI assessed the competitive environment—who is operating in the sector, what is their go-to-market strategy, and in general how these models have been performing. Marie’s team also provided a 10-year outlook for solar renewable energy credits (“SRECs”) for certain jurisdictions. Finally, LEI developed key questions the client should ask as part of its evaluation of potential transactions in the behind-the-meter solar sector.

<i>Date:</i>	October 2016-November 2016
<i>Location:</i>	California, Kansas
<i>Company:</i>	Law firm
<i>Description:</i>	<b>Support for counsel in renewable natural gas matter</b> Marie prepared an expert report in support of litigation in Case 15CV-04225 in the District Court of Johnson County, Kansas. LEI was retained by counsel to examine the value of the green attributes of landfill gas (“LFG”) produced by a project in Kansas City and sold under long-term contract to the Sacramento Municipal Utility District (“SMUD”). Marie’s report demonstrated several flaws in the methodology relied upon by the opposing counsel’s expert witness. Marie proposed an alternative, more accurate methodology for valuing the green attributes of LFG, based on market fundamentals driven by the California RPS requirements.

<i>Date:</i>	August 2016-October 2016
<i>Location:</i>	Maine
<i>Company:</i>	Maine Public Utilities Commission
<i>Description:</i>	<b>Macroeconomic impact of biomass generation</b> Marie led an engagement to estimate the macroeconomic impact of biomass generation within the state of Maine (Maine PUC Docket No. 2016-00084). This included direct, indirect, and induced impacts on: permanent direct jobs, payments to municipalities,

*London Economics International is US-owned and operated*

	payments for fuel harvested in the State, payments for in-state resource access, in-state purchases of goods and services, and construction-related jobs and purchases. Marie used the macroeconomic model known as IMPLAN to capture the economic impacts on industries including logging, sawmills, and other forestry-related industries and well as on state and local taxes.
--	---

<i>Date:</i>	May 2016
<i>Location:</i>	ERCOT/Texas
<i>Company:</i>	Private client
<i>Description:</i>	<p><b>Examination of ancillary services</b></p> <p>Marie conducted a case study assessing the current ancillary services (“CAS”) market in ERCOT, outlining the structure of ERCOT’s proposed Future Ancillary Services Nodal Protocol Revision Request (“FAS-NPRR”), and examining the implications of ERCOT’s experience so far for the Alberta electricity market. Findings included the following: While it was widely expected that the addition of large amounts of wind (and other non-synchronous generation) on the ERCOT system would significantly increase the need for ancillary services, by 2015, ERCOT’s procurement of CAS products had not increased compared with 2011. However, the need for synchronous inertial response (“SIR”) which is not part of CAS did increase somewhat over the time period, though ERCOT did not include SIR in its FAS-NPRR.</p>

<i>Date:</i>	April 2016-May 2016
<i>Location:</i>	ERCOT/Texas
<i>Company:</i>	Renewable power investor
<i>Description:</i>	<p><b>Due diligence in ERCOT</b></p> <p>LEI was hired to perform due diligence for an investor interested in wind assets in ERCOT. Marie examined the political, legislative, and economic drivers of ERCOT’s Competitive Renewable Energy Zones (“CREZ”) and provided an assessment of state-level support for further expansion of CREZ transmission lines. She also provided assessment of and outlook for ERCOT’s and the Public Utility Commission of Texas’s views of the “system cost” of wind (the potential increased need for ancillary services and firm capacity on the system).</p>

<i>Date:</i>	June 2014-April 2016
<i>Location:</i>	Maine
<i>Company:</i>	Maine Public Utilities Commission
<i>Description:</i>	<p><b>Project manager and testifying expert</b></p> <p>Marie served as project manager, independent market expert, and expert witness for the Maine Public Utilities Commission, in the evaluation of the costs and benefits of alternatives for expansion of natural gas supply into Maine pursuant to the Maine Energy Cost Reduction Act (MPUC Docket #2014-00071). Marie reviewed and evaluated proposals for firm natural gas transportation service by pipeline developers. These evaluations included LEI’s review of commercial terms include in the pipeline Precedent Agreements that underpin capacity expansion projects; review of contract provisions for Firm Transportation Agreements and Negotiated Rate Agreements; and evaluation of the status of the FERC and state-level permitting process for each pipeline proposal. Marie provided expertise in upstream natural gas (exploration and production), midstream natural gas (interstate pipelines) and global energy markets including oil and LNG markets, to provide</p>

*London Economics International is US-owned and operated*

	a solid grounding for LEI's long-term outlook for New England natural gas prices. Marie directed the natural gas network modeling (using GPCM, an industry-standard network model of the North American natural gas system) and power simulation modeling (using LEI's proprietary POOLMod model) to arrive at a quantitative cost-benefit analysis of proposals. She authored reports provided to the Commission; responded to discovery from other parties; prepared discovery questions and cross-examined witnesses; reviewed testimony by other parties and provided assessments of the issues presented; and she served as an expert witness in the proceedings.
--	--

<i>Date:</i>	November 2015-December 2015
<i>Location:</i>	US Northeast
<i>Company:</i>	Renewable power developer
<i>Description:</i>	<b>Due diligence for assets in ISO-NE (Maine)</b> LEI was hired by a wind developer to provide a quantitative assessment, based on an economic dispatch model, of congestion/curtailment risk for a wind asset in Maine. LEI used its proprietary dispatch model, PoolMod, to provide an outlook from 2016 through 2020 of hourly LMPs, as well as the components of LMP (energy, losses, and congestion). We incorporated information from the interconnection impact study to examine system limits for the plants in question. LEI also provided an assessment of risk of outages based on NERC outage data for NPCC. Marie led the project

<i>Date:</i>	October 2015-November 2015
<i>Location:</i>	ERCOT/ Texas
<i>Company:</i>	Private equity company
<i>Description:</i>	<b>Due diligence for assets in ERCOT</b> LEI was hired to forecast the potential energy revenues of two wind farms in Texas, using its proprietary dispatch model, PoolMod. Marie led the project, and also examined the implications of the PPA related to the two wind farms.

<i>Date:</i>	July 2015
<i>Location:</i>	North America/United Kingdom
<i>Company:</i>	UK Department of Energy and Climate Change
<i>Description:</i>	<b>Examination of design of auctions</b> Marie participated in a review of auction design for the UK DECC. The UK market regulator was interested in whether US power markets evaluate generation bids based on criteria other than the price bid, specifically, if the length of contract had a role in the auctions. LEI reviewed capacity market rules for PJM, ISO-New England and the New York ISO. Marie examined whether and for how long a "lock-in" option for the first year capacity price is offered to new generation assets bidding into the auctions. She also reviewed international spectrum auctions, North American gas transmission open season rules, and international auctions for toll roads to examine whether and how duration or length of contract is incorporated into bidding.

<i>Date:</i>	May 2015
<i>Location:</i>	Connecticut; Virginia

*London Economics International is US-owned and operated*

<i>Company:</i>	Private equity company
<i>Description:</i>	<b>Review of gas transportation contracts</b> Marie evaluated contracts for firm gas transportation capacity for gas-fired plants in Virginia and Connecticut.

<i>Date:</i>	April 2015
<i>Location:</i>	Connecticut; New Jersey
<i>Company:</i>	Private equity company
<i>Description:</i>	<b>Outlook for natural gas prices</b> LEI was retained to forecast delivered gas prices in New England (Connecticut) and PJM (New Jersey) and locational marginal prices as well as retail electricity prices in Connecticut. Marie led the gas market analysis.

<i>Date:</i>	August 2014 - January 2015
<i>Location:</i>	North America
<i>Company:</i>	Private client
<i>Description:</i>	<b>Monthly energy market reports</b> LEI was engaged to support an energy company's Regulatory Group in its administering of the company's compliance program. The purpose of the engagement was to ensure that client's transactional and business groups were made aware of market rules and regulatory risks. This involved creating and delivering a monthly report covering developments by regional market and traded products which included: energy, capacity, long-term transmission service, FTR auctions, ancillary services, diesel oil, PRB coal, natural gas commodity, transmission, and storage, RECS, and CO <sub>2</sub> . Marie served as project manager and executive editor of the monthly report and monthly conference call, and provided the research and insight on US gas, oil, and coal markets, and FERC activities.

<i>Date:</i>	October 2014
<i>Location:</i>	New England
<i>Company:</i>	Private equity company
<i>Description:</i>	<b>Assessment of ancillary service market</b> To support potential acquisition of hydropower assets, Marie provided analysis of ISO-New England's Locational Forward Reserves Market ("LFRM").

<i>Date:</i>	April-June 2014
<i>Location:</i>	US Midwest
<i>Company:</i>	Private equity company
<i>Description:</i>	<b>Due diligence for asset in PJM</b> For due diligence related to a district cooling system in the Midwest, Marie reviewed contracts and developed a model for projecting revenues and gross margins for the asset. Marie provided insight by identifying the potential for lower customer contract prices at renewal (in contrast to the seller's assumptions) and other areas of revenue risk.

<i>Date:</i>	June 2014
<i>Location:</i>	North America

*London Economics International is US-owned and operated*

<i>Company:</i>	Law firm
<i>Description:</i>	<b>Examination of FERC policies and practices</b> LEI was engaged by a law firm on behalf of a Canadian energy company to provide market advisory for an investigation related to the timing of outage scheduling under PPAs. Marie provided research and expertise covering FERC practices related to monitoring, enforcement, and definition and prosecution of alleged market manipulation.
<i>Date:</i>	April-May 2014
<i>Location:</i>	Nova Scotia
<i>Company:</i>	Government of Nova Scotia
<i>Description:</i>	<b>Organization of energy system</b> Marie provided a detailed overview of the Nova Scotia gas and power sectors, including governing institutions, the legal and regulatory framework, recent developments and challenges, and SWOT analysis.

## **SPEAKING ENGAGEMENTS:**

### **Selected recent webinars and conferences**

Energy Bar Association Mid-year Meeting and Conference 2021 (virtual). Session chair: *Securitization of utility costs: Panacea or poison pill?* October 13, 2021.

International Association for Energy Economics (“IAEE”) 2021 Conference (virtual). Presentation title: *Liberalization, de-carbonization, and nuclear recovery in Japan: Outlook for long-term energy prices.* June 7, 2021.

Expert participant (virtual) in University of California Davis, Institute of Transportation Studies: *Future Scenarios of Passenger Mobility in the US: Year 2030*, October 2020.

Energy Bar Association Mid-year Meeting and Conference 2020 (virtual). Presentation title: *Performance-based ratemaking for local gas distribution companies: Lessons learned from a recent rate case.* October 13, 2020.

Boston Bar Association, 2020 Virtual Energy Conference. Session title: *Performance-based Ratemaking*. Presentation title: *Performance-based ratemaking: Understanding the basics, and the role of performance incentives.* July 15, 2020. <http://energyconference.bbablogs.org/>

Morgan Stanley Webcast Series | *Regulatory Outlook for Key Pipeline Projects with Experts Bloomberg and London Economics International*. Presentation title: *Impacts of a potential shutdown of Enbridge Line 5.* July 10, 2020.

US Association for Energy Economics, Webinar. Presentation title: *Taking a look ahead: The long-term impacts of a crisis on oil demand.* June 29, 2020. <https://www.usaee.org/webinars/webinar-kleinberg.aspx>

US Energy Association, Webinar. Presentation title: *Taking a look ahead: The long-term impacts of a crisis on oil demand*. May 27, 2020. <https://usea.org/event/taking-look-ahead-long-term-impacts-oil-demand-after-crisis>

USAAE/IAEE 37th Annual North American Conference. Denver, CO. Session chairman/moderator, concurrent session title: *Regulation*. November 6, 2019.

ASSA/IAEE. Atlanta, GA. Session title: *Single and bi-directional economic dependencies in energy systems*. Presentation title: *Business and innovation cycles in the US Upstream: Surviving the ups and downs*. January 2019.

MIT/SPE/YPE. Cambridge, MA. Session chairman/moderator, session title: *Meeting the changing demand for US natural gas: Do markets alone suffice or are regulatory changes necessary?* April 26, 2018.

ERCOT Market Summit. Austin, TX. Session chairman/moderator, session title: *Perspectives on ERCOT Market Reforms*. February 28, 2018.

ASSA/IAEE. Philadelphia, PA. Session title: *Energy Economics, Regime Changes, and Sustainability*. Discussant for paper "What's killing nuclear power in US electricity markets?" January 6, 2018.

## **PUBLICATIONS:**

### **Technical/Academic**

Kleinberg, Robert and Fagan, Marie, "Business Cycles and Innovation Cycles in the U.S. Upstream Oil & Gas Industry." (December 1, 2019). USAAE Working Paper No. 19-423. Available at SSRN: <https://ssrn.com/abstract=3508466> or <http://dx.doi.org/10.2139/ssrn.3508466>

"The Disappearing Middle Class: Economies of Scale in Exploration and Development," presented at the International Association for Energy Economics, 26th annual conference, Aberdeen, June 2002.

"The Key Role of Technology in Reducing Offshore Finding and Development Costs," *Fundamentals of the Global Offshore Industry*, The Petroleum Economist Ltd., London, September 2001.

"The US Oil and Gas Supply Situation: How Did We Get Here?" guest lecture, Clark University, Worcester, MA, October 2000.

"The Technology Revolution and Upstream Costs," *The Leading Edge* (Journal of the Society of Exploration Geophysicists), June 2000.

Review of *Exploration, Development, and Production – Texas Oil and Gas 1970-1995*, for the *Journal of Economic Literature*, 1999.

"Resource Depletion and Technical Change: Effects on US Crude Oil Finding Costs from 1977 to 1994," *The Energy Journal*, 1997.

"Inter-jurisdictional Competition, Resource Rents, Tax Exporting, and Oil and Gas Severance Taxes," *The Journal of Energy Finance and Development*, 1997, with Kevin Forbes.



### ***London Economics International is US-owned and operated***

*"Fiscal Illusion and Fiscal Sclerosis: The Case of Oil and Gas Severance Taxes,"* presented at the US Association for Energy Economics/International Association for Energy Economics conference, Boston, MA October 1996.

*"Prices, Depletion, and Technical Change 1977-1990: The Declining Cost of Crude Oil,"* presented at the Allied Social Science Association Annual Meeting, American Economic Association/International Association for Energy Economics session, San Francisco, CA, January 1996.

*"Technical Change and Scale Economies in US Onshore Oil and Gas Exploration 1977-1990,"* presented at the Southern Economic Association meeting, New Orleans, LA, November 1993.

### **US Department of Energy**

*State Energy Severance Taxes*, DOE/EIA-TR/0599, Washington, DC, 1995.

*Oil and Gas Development in the United States in the Early 1990s: An Expanded Role for Independent Producers*, DOE/EIA-0600, Washington, DC, 1995, with Jon Rasmussen.

*"Trash to Energy: A Burning Issue,"* 1988 *Selected Papers and Presentations by DOE's Policy Integration Staff*, US Department of Energy, Office of Policy, Planning and Analysis, Office of Policy Integration, Washington, DC, December 1988, with Peggy Podolak.

### **IHS/CERA Publications**

*Global Prospects for Shale Gas: Assessing Above-ground Risks and Enablers* IHS CERA Private Report 2013  
*The Impact of Technology on US Offshore Finding and Development Costs* IHS CERA Private Report 2013  
*The Next E&P Hotspots: What are the Leading Indicators?* IHS CERA Decision Brief 2012  
*Taking the Shale Gale International: Lessons from North America* IHS CERA Decision Brief 2012  
*Prospects for Shale Gas in Europe: Insights from CERAWEEK* IHS CERA Insight 2012  
*Envisioning a Long-term Future for Coal* IHS CERA Insight 2011  
*North American Power Industry Landscape 2011* IHS CERA Decision Brief 2011  
*Common Ground? CERAWEEK Perspectives on US Electric Power Transmission* IHS CERA Insight 2010  
*North American Power Industry Landscape 2010* IHS CERA Decision Brief 2010  
*Mexico's Road to Renewable Power: The Cost of a Range of Targets and Options* IHS CERA Decision Brief 2009  
*Competitive Bidding: A Key Tool for Capital Formation in the US Power Sector* IHS CERA Decision Brief 2009  
*Financing the Global Power Business: Insights from CERAWEEK* IHS CERA Insight 2009  
*Concentrating Solar Power: US Demand Heats Up* IHS CERA Decision Brief 2008  
*US CO2 Policy Quandary: Near-term Reductions Imply a High Carbon Price* IHS CERA Private Report 2008  
*The US Energy Act of 2007: Addressing the Demand Side of Electric Power* IHS CERA Insight 2008  
*Investors' Energy Monthly* December 2004 – November 2007  
*Some Sail, Some Fail: Utility M&A after PUHCA* IHS CERA Decision Brief 2006  
*Another Decade of Rising Upstream Costs?* IHS CERA Decision Brief 2006  
*Merchant Power's Recovery: Four Dimensions of Value* IHS CERA Private Report 2006  
*PUHCA Repeal and Utility M&A: One Big Obstacle Down, Many Remain* IHS CERA Decision Brief 2005  
*North American Gas Monthly Briefing* January 2003 - June 2004  
*Costs are Up for North American Natural Gas* IHS CERA Decision Brief 2004  
*Bottom Line: A New Long-term Floor for North American Gas Prices* IHS CERA Private Report 2004  
*Upstream Gas Costs and North American E&P Strategy: Avoiding the Edge* IHS CERA Decision Brief 2004  
*Can We Drill Our Way Out of the (Natural Gas) Supply Shortage?* IHS CERA Decision Brief 2003

## ***London Economics International is US-owned and operated***

*Cost-effective Deepwater Development: Seeing the Forest from the "Trees"* IHS CERA Private Report 2001  
*Optimization and the Role of R&D* IHS CERA Decision Brief 2001  
*Upstream Spending Plans: Inflation in the Pipeline* IHS CERA Alert 2001  
*Upstream Technology on the Horizon* IHS CERA Decision Brief 2000  
*Upstream Costs--Why the Gap will widen* IHS CERA Decision Brief 1999  
*The Impact of Falling Oil Prices on Upstream Operations* IHS CERA Decision Brief 1998  
*The Technology Revolution and Upstream Costs* IHS CERA Private Report 1998  
*Managing the Rig Shortage* IHS CERA Decision Brief 1997

## **News Media**

"Economists wonder: Did COVID-19 accelerate timeline for peak oil demand?" (excerpts from USEA webinar *Taking a look ahead: The long-term impacts of a crisis on oil demand*, May 27, 2020). S&P Global Market Intelligence. June 8, 2020.  
[https://platform.mi.spglobal/SNL.Services.Export.Service/v2/Export/Retrieve?filename=Html\\_2bdf6b05-697e-4a2b-8768-579bf532b596.html](https://platform.mi.spglobal/SNL.Services.Export.Service/v2/Export/Retrieve?filename=Html_2bdf6b05-697e-4a2b-8768-579bf532b596.html).

"Upstream oil costs on the rise" (excerpts from *Another Decade of Rising Upstream Costs?* IHS CERA Decision Brief 2006), *The Wall Street Journal Morning Brief*, June 28, 2006.

"Unnatural Gas Prices," live television interview for CNN-FN, December 23, 2003.

## **IHS/CERA CERAWeek Roles**

Chairman, Coal Plenary *Envisioning a Long-term Role for Coal*, March 10, 2011  
Chairman, Strategy Session *Financing the Power Future*, March 10, 2011  
Chairman, Expert Dialog *North American Gas and Power Scenarios Wildcards*, March 9, 2011  
Chairman, Strategy Session *Financing a North American Power Sector in Transition*, March 12, 2010  
Panelist, CERA Insights *Global Power Outlook*, March 12, 2010  
Chairman, Strategy Session *US Electric Power Transmission: the Battle of the Jurisdictions*, March 11, 2010  
Chairman, Critical Issue Forum, *Financing the Power Sector in a Turbulent Economy*, February 12, 2009  
Chairman, Critical Issue Forum *Power Sector Investment: Global Capital, Local Strategies* February 15, 2008  
Panelist, Leadership Circle *Global Power Outlook* February 14, 2008  
Chairman, Critical Issue Forum *Rising Costs and the Outlook for North American Gas*, February 14, 2007  
Host and Commentator, *Reception for Institutional Investors* February 13, 2007  
Panelist, Critical Issue Forum *Oil Sector Finance: The Cliff behind the Clouds?* February 13, 2007  
Host and Commentator, *Reception for Institutional Investors* February 7, 2006  
Chairman, Critical Issue Forum *Financing the Oil Future: A Three-Trillion Dollar Dilemma* February 7, 2006  
Host and Commentator, *Reception for Institutional Investors* February 15, 2005  
Chairman, Critical Issue Forum *North American Natural Gas: E&P in a Mature Region* February 11, 2004  
Chairman, Expert Briefing *North American Gas E&P Strategy: Getting off the Treadmill?* February 12, 2003  
Panelist, Expert Briefing *Bracing for a Wild Ride: North American Gas Market Outlook* February 11, 2003

## 6.2 Barbara Porto

*Senior Consultant, London Economics International LLC*



### KEY QUALIFICATIONS:

Barbara is a Senior Consultant at London Economics International LLC ("LEI"), where she supports the firm's technical engagements with regulators, utilities and private equity firms on issues regarding market design, project evaluations, wholesale price analysis, and utility management/performance auditing. Barbara is LEI's lead expert and modeler for the California ISO's energy and capacity markets, responsible for analyzing changes in market rules and system dynamics. Barbara also serves as a key modeler for LEI's gas pricing model.

Prior to LEI, Barbara was an Analyst at ENEVA, the largest private thermal power generation company in Brazil, where she was responsible for market intelligence reports and procurement strategic planning.

### EDUCATION:

Institution	Hult International Business School
Date:	August 2014
Degree(s) or Diploma(s) obtained:	MBA - Master of Business Administration

Institution	COPPEAD/UFRJ (Brazil)
Date:	December 2010
Degree(s) or Diploma(s) obtained:	Finance Certificate

Institution	Universidade Estácio de Sá (Brazil)
Date:	June 2010
Degree(s) or Diploma(s) obtained:	Bachelor of International Relations

### EMPLOYMENT RECORD:

Date:	January 2015 - Present
Location:	Boston, MA
Company:	London Economics International LLC
Position:	Consultant

Date:	July 2008 - August 2013
Location:	Rio de Janeiro, Brazil
Company:	ENEVA (subsidiary of E.ON AG)

Position:	Analyst (July 2010 – August 2013) Intern (July 2008 – June 2010)
-----------	---

## RECENT PROJECT EXPERIENCE:

- ***LEI's Continuous Modeling Initiative (CMI):*** As lead California market, Barbara tracks and evaluates the impact of on-going structural and regulatory changes in the electricity market to produce detailed price forecast and associated analyses on an ongoing semi-annual basis using LEI's in-house price forecast software, POOLMod.
- ***Reliability metrics case studies:*** LEI was engaged by a law firm to provide market design, regulatory, and economic advice to assist the Firm in rendering legal advice to Luminant (Vistra Corporation) in litigation challenging regulatory action, as well as regulatory advocacy. The engagement consisted of three Phases: 1) analysis and research to support proof-of-concept and initial estimates; 2) preparation of written testimony and litigation support; and 3) advisory on market design options. Barbara assisted in Phase 3 with case studies on reliability metrics and standards in the state of California and Brazil.
- ***Montana-Dakota Utilities rate case:*** LEI was engaged by the North Dakota Public Service Commission as the outside independent technical consultant supporting the Commission's ratepayer advocacy staff in a rate case involving Montana-Dakota Utilities. LEI examined key components of the rate case, which included the depreciation study, tax rates, environmental upgrades, transmission investment, the ROE/common equity ratio, amortization for early retirement of coal plants, and impacts on residential rates versus impacts on other classes of service. LEI prepared data requests, and provided written and oral testimony. Barbara worked on the sections of the audit related to depreciation and environmental upgrades.
- ***Management audit of Entergy Mississippi:*** LEI was engaged to conduct the annual fuel procurement and management audit of Entergy Mississippi. The LEI team assessed a complex array of issues including the Company's organization and staffing, risk management and company controls, coal procurement and inventory management, coal transportation, natural gas procurement and trading, plant operations and generation portfolio management, energy procurement and trading, and costs associated with the Grand Gulf nuclear plant. LEI prepared a comprehensive report detailing its analysis, findings, and recommendations, and appeared before the Mississippi Public Service Commission to present its findings and recommendations.
- ***Ancillary service revenue streams for long-duration storage in California:*** LEI was engaged by a developer to evaluate potential revenue stream of its battery storage technology that is capable in providing very long-duration storage. Specifically, LEI is helping the client understand the value of regulation, spinning reserve, frequency regulation, voltage support and other revenue streams that its battery can earn in the California market under current market structure and under future potential market designs.
- ***Financial Transmission Rights ("FTRs") and Auction Revenue Rights ("ARRs") Market Review:*** LEI has been engaged by a Regional Transmission Operator ("RTO") to conduct a holistic assessment of its FTR markets and ARRs to determine whether the current ARR/FTR processes constitute appropriate mechanism to ensure that load receives the optimal value of

the transmission system for which it is paying through its transmission access charges. Barbara was responsible for analyzing the FTR/ARR metrics and target allocation process, as well as comparing it to similar mechanisms in other jurisdictions.

- ***Audit of Legacy Generation Resource Rider for Ohio Valley Energy Company:*** LEI was engaged by the Public Utility Commission of Ohio to perform an audit of the prudence and performance of the generation purchase riders of Duke Energy Ohio, AEP Ohio, and AES Ohio for the output of two coal plants operated by Ohio Valley Energy Company ("OVEC"). Barbara was responsible for examining OVEC's participation in the PJM market and the fuel and variable cost expenditures to determine whether they were prudently incurred.
- ***Hydro portfolio due diligence:*** LEI was hired by a private equity firm to provide technical assistance and due diligence on the acquisition of a portfolio of hydropower projects located in multiple states across the US. The Projects consisted of a mix of run of river hydro and large pumped storage at various levels of development. As part of its due diligence, LEI carried out a general review of the hydropower and pumped storage markets to evaluate the relative competitiveness of these technologies especially in markets with high renewables and storage penetration; LEI also developed a 20-year forecast of revenue streams for the relevant assets in the market of interests and reviewed the assets marketability post contract expiration. Finally, LEI reviewed key offtake contract to make recommendations on replicability (or lack thereof) of such contracts especially in highly competitive regions. Barbara assisted with benchmark research to analyze the replicability of the proposed commercial transaction.
- ***Due diligence on a potential wind portfolio acquisition:*** LEI was engaged by an infrastructure investment fund to provide consulting and advisory services in support of due diligence efforts on a potential wind portfolio acquisition in ISO-NE and California. The scope of the project included reviewing data room materials, critically reviewing a market report prepared by the sell-side consultant, preparing independent long-term 20-year energy and capacity price forecast for the target assets under two different scenarios, one reflecting a base case scenario with nation-wide carbon tax implemented by 2028, and another reflecting decarbonization goal achieved through non-carbon tax policies. Barbara was responsible for the California portion of the project, conducting extensive and detailed review of the materials provided, additional research on various topics, and performing the California modeling activities.
- ***Management audit of fuel adjustment clause for Entergy:*** LEI was engaged by Louisiana Public Service Commission ("LPSC"), Docket No. X-35523, to perform an audit of the Fuel Adjustment Clause filings of Entergy Louisiana, LLC. Barbara assisted with developing and analyzing data requests to evaluate if fuel costs were prudent and in compliance with LPSC orders.
- ***Audit of fuel adjustment clause for Entergy Louisiana:*** LEI was engaged by Louisiana Public Service Commission, Docket No. X-36643, to perform an audit of the Fuel Adjustment Clause filings of Entergy Louisiana. The audit involved detailed examination of monthly true-ups of incurred costs with billed costs; the appropriateness of interest rates as applied to over-recovered or under-recovered costs; examination of the impact of deferred costs; reconciliation of expenses recorded in FERC Form 1 account categories ("as booked") with expenses included in monthly fuel adjustment clause filings; the prudence and reasonableness of costs incurred

for oil, gas, coal, and nuclear fuel and transportation, and an assessment operating performance of utility generating assets. Barbara worked on the sections of the audit related to fuel and purchase power costs, developing and analyzing data requests to evaluate if such costs were prudent and in compliance with LPSC orders.

- ***Audit of federal environmental adjustment clause for Entergy Louisiana:*** LEI was engaged by the Louisiana Public Service Commission to perform an audit of the Federal Environmental Adjustment Clause ("FEAC") filings of Entergy Louisiana, LLC ("ELL"). The assignment included identifying any irregularities, including but not limited to, incorrect assessment of calculations and recovery of unauthorized expenses via the FEAC. LEI examined utility purchases and sales of air emission credits needed to comply with the Clean Air Act Amendments ("CAAA") of 1990 as well as the Clean Air Interstate Rule ("CAIR") and its successor, the Cross State Air Pollution Rule ("CSAPR"). LEI made findings and recommendations concerning whether the costs passed through the adjustment clause were or were not reasonable and prudent, and whether the costs were appropriate for recovery in the EAC mechanism and consistent with LPSC Orders and rules. Barbara supervised and directed the audit.
- ***Audit of fuel adjustment clause for Cleco Power:*** LEI was engaged by Louisiana Public Service Commission ("LPSC"), Docket No. X-35522, to perform an audit of the Fuel Adjustment Clause filings of Cleco Power. Barbara assisted with developing and analyzing data requests to evaluate if fuel costs were prudent and in compliance with LPSC orders.
- ***Application for firm transportation on a gas pipeline:*** The MA Attorney General's Office of Ratepayer Advocacy ("AGO") engaged LEI to examine the application of National Grid d/b/a Boston Gas for approval to execute a contract with Algonquin, for firm transportation ("FT") on the Atlantic Bridge Project (DPU 19-132). The project included examining National Grid's projections of gas demand and its assumed resources to meet demand; examining the Assigned Precedent agreement for the FT as well as other documents; and providing a critique of the assumptions driving National Grid's cost-benefit analysis. Barbara assisted with reviewing briefs, developing interrogatory requests, and evaluating the responses to such requests.
- ***Stranded cost assessment:*** LEI was retained by a Midwest cooperative seeking to cease purchasing supply from the incumbent and rather opt for an alternate supply provider. As part of the engagement, LEI prepared a critique of the stranded cost estimate provided by the incumbent provider and calculated its own estimate of the stranded cost payment based on FERC's policy guidelines in Order 888. LEI's calculation of market value for the released energy and capacity from the incumbent t provided was based on its own forecast of energy and capacity prices in the MISO markets. LEI's report was filed with FERC as part of the litigation procedures. Barbara was responsible for the capacity market analysis, reviewing thousands of capacity transactions in the MISO region.
- ***2019 Transmission + storage:*** For a transmission developer in the in Northeast, LEI modeled various portfolios of renewable generation assets (including wind, solar, and hydro resources) together with various quantities and technologies of storage resource to analyze, and optimize, the capacity factor and delivered price for energy on the proposed HVDC transmission line. LEI also modeled customer load at the withdrawal end of the line together

with additional storage to analyze the benefits of these storage resources to provide load-following service. Barbara assisted with research on the costs and technical specifications of various storage technologies.

- ***Economic development benefits of the CAES:*** LEI was engaged by Range EES to analyze the local economic development benefits associated with the construction and operations of a Compressed Air Energy Storage (“CAES”) project at the site of the soon-to-be-retired Intermountain Power Project plant in Millard County, Utah (the “Project”) using the REMI PI+ model. Barbara assisted the REMI modeller with research, conducting model runs and in the composition of the final report.
- ***Fuel Audit of Mississippi Power Company:*** LEI was engaged for a two-year term to conduct the annual management audits of the oil, gas, coal, nuclear fuel, and energy procurement activities of Mississippi Power Company. The LEI team assessed a complex array of issues including fuel and energy contract terms and the prudence of fuel procurement and inventory practices. LEI appeared before the Commission to present and defend findings. Barbara worked on the procurement and inventory management sections of the audit related to natural gas and coal.
- ***OPG TFP study 2019:*** LEI was engaged to support Ontario Power Generation in relation to its second-generation hydroelectric payment amounts price-cap application before the Ontario Energy Board (“OEB”). The project involved performing an updated TFP study reflecting the OEB’s 2017 Decision on the first-generation price-cap index. Other key tasks were the preparation of analysis and written evidence assessing whether the inflation factor and treatment of the Capacity Refurbishment Variance Account remain appropriate. Barbara worked on the inflation factor, physical TFP, coauthored the report and assisted on information-gathering.
- ***Consultancy Study on Effective Carbon Prices:*** As part of a consortium, LEI was hired by the NCCS to undertake a study on effective carbon prices faced by energy-intensive manufacturing sub-sectors in jurisdictions across Asia, Middle East, Europe, and North America. Specifically, LEI was tasked with studying carbon policies in China, Middle East, Taiwan, USA, and Canada. The deliverables, consisting of a report and a dashboard tool, allowed the NCCS to compare effective carbon prices across competitor jurisdictions in these key manufacturing sectors and thus inform current and future policy decisions regarding the level of Singapore’s carbon price and wider climate change policy. Barbara was responsible for the Panama study.
- ***Fuel Audit of Entergy Mississippi:*** LEI was engaged by a public service commission to audit management activities of a major vertically-integrated utility in the MISO region. LEI assessed the utility's practices for economical purchase and use of fuel and electric energy, assessed relevant fuel and energy contract terms, investigated the operations of the utility's coal and nuclear generation units, and reviewed the prudence of coal inventory levels and inventory control procedures. Barbara worked on the procurement and inventory management sections of the audit related to natural gas, oil, and coal.
- ***Audit of AEP Ohio Alternative Energy Rider:*** LEI was engaged in 2018 by the Public Utility Commission of Ohio to perform a management/performance audit of the Alternative Energy Rider of the Ohio Power Company (AEP Ohio). LEI examined processes involved in

procuring RECs and SRECs. LEI compared and benchmarked AEP Ohio RECs and SRECs costs and other operational results against data from public sources. LEI created a working model of the true-up process and provided quantitative results comparing the impact of quarterly versus semi-annual true-up periods on the utility and on ratepayers. Barbara performed analysis on RECs benchmarking, inventory, and compliance, as well as the cost of compliance and the approach used by AEP Ohio to calculate the cost of RPS compliance.

- ***Consulting Services and Forecasts Related to Avoided Energy Supply Costs:*** LEI was retained to assist in the review of the avoided energy supply costs as reported in the Avoided Energy Supply Cost ("AESC") 2015 - Update of December 16, 2016 and provide independently developed forecasts of energy supply costs and/or wholesale electricity and natural gas prices in New England. As part of the required services, the LEI undertook a review of the AESC and provided expert analysis of the AESC assumptions, methodology and results. LEI also advised the Commission and its staff with respect to the application of the AESC in the context of evaluating the cost effectiveness of energy efficiency measures. In addition, LEI provided independently developed energy supply costs and/or wholesale electricity and natural gas prices for the region that reflect current market conditions and outlooks. Barbara was responsible for the natural gas and other fuels price outlook review and performing natural gas forecast.
- ***Market and Economic Impact Consulting:*** LEI was retained by the Maine PUC to review and critique the analysis filed by Central Maine Power ("CMP") regarding the benefits to Maine resulting from the New England Clean Energy Connect ("NECEC"), which is a 1,200 MW HVDC Transmission Line from the Quebec-Maine border to Lewiston. The analysis includes work related to the regional energy markets, including the effect of the NECEC on a) wholesale energy, capacity, and ancillary service costs for Maine ratepayers b) impact on price volatility during natural gas price spike events; and c) greenhouse gas (GHG) reduction benefits. In addition, the analysis will also include work related to economic benefits to Maine from the NECEC including a) job creation, both direct and indirect; b) employment impacts from electricity price reductions and associated cost savings; c) economic development benefits and d) municipal tax revenues. Barbara was responsible for the natural gas price outlook review and performing natural gas forecast.
- ***Natural gas generation asset performance review:*** For an international client, LEI prepared a memo reviewing the performance of a generation asset in the NYISO wholesale markets. The memo included a review of the plant's competitive advantages and disadvantages from the point of view of its technology, operational characteristics, fuel procurement options, location with respect to transmission constraints. LEI's analysis also included a view on likely short and medium market conditions, together with potential market developments, that could affect the plant's revenues. Barbara was responsible for the fuels and plant performance sections of the report.
- ***Biomass power plants economics:*** LEI was retained to assess the financial viability of select biomass power plants in the next few years and confirm the plant's assertion that a discount on certain transmission costs was required in order to avoid plant closures. Barbara led the engagement, creating an estimated pro forma income statement to assess whether the select biomass plants are expecting to make positive (or negative) gross profit margin in the next few years, 2018-2021. The financial model presented a range of market revenues that the



power plants can earn from the sale of energy, capacity, and RECs in ISO-NE's control area, relative to an estimate of going forward operating costs for two power plants. The model included five scenarios.

- **Enbridge Line 5:** For a non-governmental organization ("NGO") LEI examined the current and future role of Enbridge Line 5 on oil consumers and producers in the State of Michigan. LEI's analysis covered a) the extent to which refineries which serve Michigan consumers require Enbridge Line 5 to provide crude oil; b) the extent to which consumers of propane in Michigan's Upper Peninsula rely on Enbridge Line 5; and c) the extent to which producers of crude oil in Michigan's Lower Peninsula rely on Enbridge Line 5. Barbara assisted with research tasks and coauthored the report.
- **Cost of Utility-Scale Solar:** For a large utility, LEI performed a detailed bottom-up analysis of the range of costs for building a utility-scale solar farm in a Canadian province. LEI researched potential costs for multiple solar module technologies, interconnection options, and land types. The cost analysis customized the hardware, labor, and other costs into the province's business landscape so as to create an accurate representation of the costs for building a solar generation resource. Barbara assisted on the research, composition of the cost model and final report.
- **Econometric study of oil demand elasticities:** LEI was engaged by the Columbia University School of International and Public Administration's Center on Global Energy Policy ("CGEP") to conduct econometric analysis of global oil (crude oil and key refined products) demand and its income and price drivers. Barbara conducted a portion of the econometric analysis using STATA and coauthored the report.
- **IE for Idaho Power 2026 AS RFP:** LEI was hired by Idaho Power Company to serve as an Independent Evaluator for its 2026 all-source energy (including storage) and capacity resources RFP ("2026 AS RFP"). The role of LEI as the IE was to oversee the competitive bidding to ensure that it was conducted fairly, transparently, and properly in congruence with the Oregon competitive bidding rules. LEI was tasked to carry out a thorough independent review, evaluation and scoring of all submitted bids (consistent with Oregon's competitive procurement guidelines), and compare findings to IPC's. Barbara was a key member of the team, where she coauthored all IE reports and managed the information-gathering and summarizing process, which involved information from over 100 bids, and multiple documents from each bidder.
- **IE for PacifiCorp 2017S RFP:** LEI was retained as an independent evaluator ("IE") by PacifiCorp for its system-wide 2017 Solar RFP. LEI reviewed PacifiCorp's Solar RFP, facilitated and monitored communications between PacifiCorp and bidders, performed a review of the initial shortlist evaluation and scoring, and filed status reports and the IE closing report. Barbara coauthored the status and IE report, and managed the information-gathering and summarizing process, which involved information from over 100 bids, and multiple documents from each bidder.
- **White paper for debunking myths surrounding transmission investment:** LEI was retained to provide a research paper highlighting the opportunity to evolve system planning practices to a more resilient transmission system in the longer term, one that promotes efficient electricity

production and consumption decisions and efficient infrastructure investment. Barbara assisted on the research tasks.

- ***Investment Opportunities in the US and Canada:*** For a private equity client, LEI reviewed all investable energy sectors in the US and Canada (except oil and gas exploration and production). The sectors included: electricity generation (natural gas, wind, solar, hydro), AMI, distributed Resources, demand response, retail and gentailers, gas LDCs, gas storage, gas pipeline transportation, LNG-related infrastructure, vertically-integrated utilities, electric distribution, and water utilities. LEI assessed the investment potential of each sector for the next five years and proposed a methodology to screen and identify investment opportunities and execute on these opportunities. Barbara was responsible for the electric generation sector and the Alaska regional study.
- ***Hydro Ancillary Services:*** For a private developer, LEI reviewed the eligibility of small (less than 25 MW) run-of-river hydroelectric electric generation facilities to provide ancillary services in the ISO-NE, MISO, NYISO, and PJM jurisdictions. Barbara assisted with research tasks.
- ***Total Factor Productivity study:*** LEI prepared a report for OPG entitled “Empirical Analysis of Total Factor Productivity Trends in the North American Hydroelectric Generation Industry.” The purpose of this report was to share findings from LEI’s total factor productivity (“TFP”) study, which estimated TFP trends for a select group of peers from the North American hydroelectric generation industry. Data for this study covered an eleven-year period from 2002-2012. This study was further updated for newly available data (encompassing operating costs and other statistics for calendar years 2013 and 2014). LEI also supported OPG through 2017 in recommending an appropriate X factor and I factor to use in a I-X regime for hydroelectric generation. Barbara coauthored the report and assisted on information-gathering.
- ***Pacifico Chile-Peru interconnection assessment:*** In 2014, LEI assessed the impact of the construction of the 1000 MW Pacifico HVDC transmission interline between Southern Peru and Northern Chile. LEI also provided due diligence support and market analysis for the Peruvian and Chilean electricity markets to the team of investors backing the project. In 2016, the model was updated to the current market condition. Barbara assisted with research tasks.
- ***Transmission open solicitation:*** LEI was retained by a transmission developer to serve as Independent Examiner for a proposed merchant transmission project open solicitation process. The project entailed designing the solicitation process, meeting with potential shippers on the line to garner early interest, drafting announcements and press releases, conducting information sessions, updating the solicitation website, evaluating and ranking bids, assisting both bilateral negotiations with shippers, and submitting a report to FERC as part of the developers' Section 205 filing. Barbara coauthored the IE report and managed the information-gathering.
- ***ComEd congestion analysis:*** LEI was retained by a transmission utility to provide an overview of resources in the Chicago area and the Commonwealth Edison (“ComEd”) zone and analyze the congestion of several nodes within the Chicago area and shorelines sites of Lake Michigan. Barbara assisted with research tasks.

- ***Brazilian electricity market credit crisis review:*** For a Canadian electricity transmission company, Barbara conducted theoretical and empirical analysis of the Brazilian Electricity Market Credit Crisis highlighting interesting lessons for the Alberta market. Topics explored include: credit/financing issues, system reliability, government interventions, power market risks, resources diversity.
- ***TransAlta Climate Change 2016:*** LEI was retained to provide ongoing research, analytical and advisory support to TransAlta as the Alberta government implements its climate change policy, which will shut down coal plants early, ramp up renewable generation, and put in place a province wide carbon tax. Part of the engagement was to perform a case study-oriented comparative review of ancillary services in North America and abroad. Barbara was responsible for the Ireland case study.
- ***Alberta Market Modeling:*** LEI was retained by the Alberta Balancing Pool to provide wholesale energy price forecasts and market revenue projections over the period 2017-2020 for various generating facilities operating in the Alberta. LEI ran multiple sensitivities accounting for changes in ownership and dispatch rights, facility decommission and carbon policy changes. LEI relied on its proprietary dispatch simulation model, POOLMod applying Conjecture theoretical approach. Barbara assisted with research tasks.
- ***Assessment of solar thermal technologies:*** LEI was retained as part of a consortium to support an energy product manufacturing firm assess the market for solar thermal technologies, with a focus on an economic assessment of solar thermal technology, assessing the value contribution of the different components of the value chain creating a molten thermal solar plant. In addition, the client asked LEI to provide support to developing business strategies for this market. LEI's conducted the analysis in 3 out of 5 high priority markets - Saudi Arabia, Morocco, and Chile. More specifically we assessed the economics for solar thermal in each market, commented on the general perception of the technology and provided a comprehensive brief on the rules governing the market access. Barbara was responsible for the Chilean market.
- ***Workshop on Incentive-Based Ratemaking ("IBR"):*** LEI was retained by the largest electric utility company in Malaysia, to conduct a capacity building workshop on IBR and technical visits to utilities and regulators worldwide that are operating under IBR-like regimes. Barbara presented to TNB's traveling contingent on PBR Requirements standards across different jurisdictions and on fundamental of Tariff Design. Barbara presented to TNB's traveling contingent on PBR Requirements standards across different jurisdictions and on fundamental of Tariff Design.
- ***Analysis of buy versus build investment decision:*** LEI was engaged by a private equity company to provide a briefing paper that compares "The Opportunities of the Buy versus Build Investment Decision." The paper contains quantitative and qualitative research and analysis, based on market data on purchase prices from recent transactions (focused on New York, New England, and PJM), versus the cost of new build assets. Barbara assisted with research tasks.
- ***Overview of hydro-dominated market:*** LEI was hired by a financial investor to provide an understanding of the dynamics underpinning hydro-dominated power markets as opposed to thermal systems. As part of this project, LEI reviewed in detail the dynamics and key

drivers of energy markets in a sample of Latin America countries including Colombia, Panama, Brazil and Chile. Colombia was the point of focus of the report, in this respect LEI compared and contrast several aspects of the Colombian markets to other jurisdictions and created a scoring card to evaluate Colombia against similar jurisdictions. Barbara assisted with research tasks and coauthored the report.

- ***Colombia market overview and revenue forecasts for target assets:*** LEI was hired by an electric operator for the purposes of valuing a portfolio of generating assets in Colombia. LEI's scope of work consists of a comprehensive review of the Colombia energy market (including fuel and power market drivers), describe in detail the functioning of both wholesale power market and firm energy market (capacity market), develop forecasts of spot prices in order to derive expected revenues for the portfolio. Colombia being a hydro dominated system, as part of its modeling exercise, LEI ran a Monte Carlo simulation to develop a series of probabilities associated with generation profiles of Colombia's hydro resources to reflect the impact of weather conditions and water inflows on hydropower plants' output. LEI summarized its research and modeling results in a final report that was presented to lenders and other interested parties. LEI was hired later to update the market fundamentals and energy prices outlook in order to evaluate the impact of evolving market conditions on a portfolio of assets acquired by the client. Barbara created the fuels forecast, assisted with research tasks for the modeling activities, and coauthored the report.
- ***Transmission project workshop:*** LEI was retained by a private client to conduct a mini-workshop to discuss the market opportunities and risks on five proposed transmission projects in the US and Mexico. Barbara was involved in the analysis of the Mexican projects.

## 6.3 Sandy (Xinyi) Chen

*Consultant, London Economics International LLC*



---

### KEY QUALIFICATIONS:

Sandy is a Consultant at London Economics International LLC (“LEI”). She has applied her analytical and research skills to a variety of projects, ranging from market analysis, regulatory and ratemaking reviews, and quantitative modeling. Sandy has also been regularly involved in the Ontario Energy Board engagements and Idaho Power Company’s resource procurement process.

Sandy holds a Master of Science in Management, from the Ivey Business School, University of Western Ontario, and a Bachelor of Mathematics/Business Administration from the University of Waterloo. Prior to joining LEI, Sandy had worked as a capital markets analyst and an analytics strategy consultant for financial institutions.

Sandy is fluent in English and Mandarin.

### EDUCATION:

University of Western Ontario, Ivey Business School, London, Ontario, Canada, Master of Science in Management, Business Analytics, 2023.

University of Waterloo, Waterloo, Ontario, Canada, Bachelor of Mathematics/Business Administration, 2022.

### EMPLOYMENT RECORD:

<b>From:</b> January 2025	<b>To:</b> present
<b>Employer:</b>	<i>London Economics International LLC, Toronto, ON</i> Consultant

<b>From:</b> February 2024	<b>To:</b> December 2024
<b>Employer:</b>	<i>London Economics International LLC, Toronto, ON</i> Research Associate

<b>From:</b> January 2021	<b>To:</b> April 2021
<b>Employer:</b>	<i>Jones Lang LaSalle, Toronto, ON</i> Capital Markets Analyst

<b>From:</b> May 2020	<b>To:</b> August 2020
<b>Employer:</b>	<i>OMERS, Toronto, ON</i>

**From:** September 2019      **To:** December 2019  
**Employer:**      Capital Markets Analyst, Portfolio Analytics  
Canadian Imperial Bank of Commerce, Toronto, ON  
Analytics Strategy Consultant

## **SAMPLE PROJECT EXPERIENCE:**

The projects briefly described below are typical of the work Sandy has performed throughout her career at LEI.

- ***Presented various performance metrics used by electric utilities in the US:*** LEI has been engaged by an electric distribution company in New England to provide a presentation on the various performance metrics used by other electric utilities in the US. In addition, LEI will look into customer surveys on performance-based ratemaking ("PBR") as well as other jurisdictions that impose financial penalties to utilities for slow response to services.
- ***Prepared quarterly reports on the cost of capital for the OEB:*** LEI was retained by the Ontario Energy Board ("OEB") to provide updates on the macroeconomic conditions of the utility sector in Ontario. As part of its advice, LEI provided an annual presentation to the OEB and senior management to discuss key issues driving changes in the utility sector. LEI provided recommendations on whether the cost of capital policy and/or methodologies for calculating and updating the parameters may warrant review due to structural changes in the sector. LEI was also asked to provide, on a case-by-case basis, analysis on where changes going forward to the approved capital structures may warrant consideration based on expected changes in risk for wires, generation and natural gas distributors in Ontario. LEI also provided variance analysis/trend analysis of cost of capital parameters, including the Return on Equity and deemed long-term and short-term debt rates based on movements of relevant economic indicators. These were presented in a quarterly report that included a number of these elements and were presented to OEB staff.
- ***Assisted in Idaho Power Company's 2026 capacity resources RFP:*** LEI was hired by Idaho Power Company to serve as an Independent Evaluator for its 2026 all-source energy (including storage) and capacity resources RFP ("2026 AS RFP"). The 2026 AS RFP was being issued to facilitate the sourcing of competitively priced resources capable of being commercially operational no later than June 1, 2026. The resources were needed to ensure IPC could address the needs identified in its latest Integrated Resource Plan (filed on December 30, 2021). The role of LEI as the IE was to oversee the competitive bidding to ensure that it was conducted fairly, transparently, and properly in congruence with the Oregon competitive bidding rules. LEI was to ensure there was no bias in the procurement process, in particular a "self-build" bias that unjustly favors utility-owned resources. Moreover, in addition to serving as an overseer of the procurement process, LEI was tasked to carry out a thorough independent review, evaluation and scoring of all submitted bids (consistent with Oregon's competitive procurement guidelines), and compare findings to IPC's.
- ***Assisted in Idaho Power Company's 2028 capacity resources RFP:*** LEI was hired by Idaho Power Company to serve as an Independent Evaluator for its 2028 all-source energy

(including storage) and capacity resources RFP (“2028 AS RFP”). The 2028 AS RFP was being issued to facilitate the sourcing of competitively priced resources capable of being commercially operational no later than June 1, 2028. The resources were needed to ensure IPC could address the needs identified in its latest Integrated Resource Plan (2023 IRP). The role of LEI as the IE was to oversee the competitive bidding to ensure that it was conducted fairly, transparently, and properly in congruence with the Oregon bidding rules. LEI was to ensure there was no bias in the procurement process, in particular a “self-build” bias that unjustly favors utility-owned resources. Moreover, LEI was tasked to develop a thorough evaluation process reflecting the procurement guidelines and apply it consistently to all resource bids received. Finally, LEI was requested to assist with OPUC with the monitoring of contract negotiations (all contracts associated with the winning bids). LEI's role consisted of documenting progress on key contract terms, reporting on unexpected challenges and issues, and providing a detailed review of the process leading to contract agreement (or the termination of negotiations)

- ***Reviewed the potential for relocating a combined cycle plant:*** On behalf of a large utility in North America, LEI reviewed the potential for relocating a combined cycle plant before the end of the equipment's service life. LEI notably assessed the current environment and future market conditions for the operation of gas-fired assets in North America. LEI also reviewed the market for, and potential value of, used equipment that would be taken from the retiring plant.
- ***Prepared the Ontario case study on network tariff reforms:*** LEI supported Frontier Economics in preparing international case studies for the New Zealand Electricity Authority on network tariff reforms. LEI focused on two North American jurisdictions - Ontario and Texas.
- ***Assistance in the development of a joint water and wastewater municipal services corporation:*** LEI was engaged by an Ontario client to develop a detailed business case supported by financial modelling to evaluate the financial and practical feasibility of the client offering a joint water and wastewater municipal services corporation based on a specific group of no more than ten municipalities initially, with the ability for additional municipalities to join over time. The financial modelling also included performing water and wastewater rate studies for each of the participating municipalities.
- ***Advisory on Generic Proceeding:*** LEI was engaged by the OEB to assist the OEB staff in finalizing the issues list in the Generic Proceeding on cost of capital and other matters related to OEB's prescribed interest rates and cloud computing deferral account (EB-2024-0063), preparing an expert report answering the questions identified in the issues list, and providing proceeding related support to the OEB staff.
- ***Review of IESO Market Rule Amendments:*** LEI was engaged by OEB staff for assistance related to an application was filed with the OEB to review certain IESO Market Rule Amendments pursuant to section 33 of the Electricity Act, 1998 (Act) (NQS Generation Group Application OEB File No. EB-2024-0331). LEI's scope included: (i) review of evidence filed by Applicant (NQS), the IESO and intervenors and assist staff in developing lines of questioning

for the Applicant and the IESO for the Technical Conference within the scope of the proceeding and the issues list; (ii) assisting OEB staff in preparation for the oral hearing, including developing further lines of questioning; and (iii) assisting OEB staff in identifying key questions of the Application and providing relevant technical advice and analysis for drafting the submission after the oral hearing (as needed).

- ***Review of the Transmission System Code:*** LEI was engaged by OEB staff for assistance related to review of the Transmission System Code (TSC) to review and update the transmission-connecting customer financial risk classification methodology set out in Appendix 4 of the TSC which is outdated and must be updated to reflect the current risk assessment methodologies and practices that can be fairly and consistently implemented by Ontario's transmitters.