



CRA Insights: Energy

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Associates

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Reflections on a transformative year for the industry and our practice

CRA's Energy Practice experienced strong growth in 2019, reflecting the increasingly complex issues facing the industry. Below, we summarize a few representative engagements for the year, share a list of publications including our colleague Seabron Adamson's new book on renewable energy finance, and look ahead to emerging issues for 2020. We appreciate the opportunity to assist our clients by providing strategic, economic, and financial expertise on energy issues the worldwide.

Representative 2019 Engagements

Utility strategy, investment planning, and regulatory support

In 2019, CRA supported numerous investor-owned and publicly owned utilities with strategy, planning, and expert testimony. This included developing resource plans for utilities considering coal retirements and evaluating investment opportunities with renewables and storage; grid modernization plans for utilities seeking to demonstrate the benefits to their regulators and limit future recovery risk; corporate strategy for gas and electric utilities facing headwinds on natural gas investment; and decarbonization plans for utilities planning around state policies.

CRA experts filed testimony in numerous utility proceedings. For *Black Hills Energy*, [Jim McMahon](#) filed testimony on qualifying facility (QF) policy related to a proposed solar plant in the state of South Dakota. For *Liberty Utilities*, Mr. McMahon filed testimony in a Certificate of Public Convenience and Necessity (CPCN) proceeding involving construction of a wind farm. For *NIPSCO*, [Patrick Augustine](#) filed testimony in four CPCN applications for wind projects and a general rate case in the state of Indiana.

CRA experts also supported stakeholder processes on behalf of several utilities. [Patrick Augustine](#) participated in stakeholder discussions with *Alliant Energy* about the company's announced Energy Blueprint in Wisconsin. [Jim McMahon](#) led stakeholder discussions in Missouri on behalf of *Liberty Utilities* and its integrated resource plan (IRP).

Mergers and market-based rates, and asset transaction support

CRA's Energy consultants continue to support clients as they participate in regulated and competitive markets in the US, and transact in the electric power M&A space. [David Hunger](#) and [Edo Macan](#) supported numerous initial, change-in-status, and triennial update market power analyses so that our clients, including several *Berkshire Hathaway Energy* utilities and *NorthWestern Energy*, were able to transact energy at market-based rates per Federal Energy Regulatory Commission (FERC) rules. Our consultants also continued to provide support and testimony for companies seeking to receive or retain market-based rates authorization for their participation in the Western Energy Imbalance Market. These analyses included market power assessments in the context of the Western Energy Imbalance Market. We also enabled transactions under Section 203 of the Federal Power Act, including between *NextEra* and *PacifiCorp* (Cedar Springs Wind Energy facility in Wyoming) by assessing the competitive impact of the underlying transactions in accordance with FERC practices.

As market advisors, CRA experts supported the diligence of numerous energy infrastructure assets, including transmission utilities, conventional power plants, and renewable generators. In 2019, our transaction support spanned nearly every US market area, including ISO/RTO footprints and bilateral market areas.

Market analysis and design

A CRA team, led by [Jeff Plewes](#), conducted a study for the *Coalition for American Energy Security* related to the impact of the International Maritime Organization's 2020 regulation on sulfur content in marine fuels (IMO 2020) and the economic impacts of participation by the United States. The study involved advanced economic modeling of fuel price and macroeconomic impacts using a customized version of CRA's Energy and Macroeconomic Response (EMR) model, as well as integrating outputs from an external US refinery model. We identified and quantified expected competing impacts on the US economy, including effects on refined product prices and sector-specific productivity and economic value consequences.

[Simon Ede](#) and [Jeff Plewes](#) were retained by the *Central Power Purchasing Authority of Pakistan* (CPPA), in coordination with the World Bank, to provide training on capacity market design issues. The training will support Pakistan's initiative to develop a new energy and capacity market model. Pakistan expects a need for new generation supply in the mid to late 2020s, and CPPA wishes to install market mechanisms to ensure resource adequacy. CRA was selected because of our extensive work advising on North American capacity market issues.

CRA was engaged by an oil major to conduct a landscape review of energy end-use technologies in the industrial and building sectors in Brazil. The scope included a review of value chains and production technologies, projections of future energy demand, and estimates of technology costs to support an analysis of likely technology deployment scenarios and the environmental impact of technology deployment.

Regulatory and litigation support

In Alberta, CRA capped nearly three years of support for various governmental entities in the process of developing an electric capacity market in the province. In January 2019, [Chris Russo](#), [Jordan Kwok](#), and Senior Consultant [Adonis Yatchew](#) testified before Albertan stakeholders on whether updated market offer behavior guidelines were needed in the Alberta electricity market during the

transition between market structures. Three months later, the same experts developed a report and provided testimony for the *Market Surveillance Administrator* before the Alberta Utilities Commission. Our report identified technical and market oversight issues associated with the proposed rules, with a focus on the potential for abuse of market power and the ability of the overall market structure to incentivize appropriate levels of investment.

Simon Ede and **Laura Sochat** were retained by *Scottish and Southern Energy* (SSE) to help it evaluate proposals by the Office of Gas and Electricity Markets (Ofgem) for a retail energy tariff price cap. CRA consultants helped SSE respond to Ofgem's estimations on smart meter costs and roll-out assumptions.

In Europe, **Seabron Adamson**, **Simon Ede**, **Christian Jeffery**, and external consultant Robin Cohen advised on a wide range of power, oil, and gas arbitrations. Projects included the valuation of damages resulting from force majeure in LNG export contracts, the termination of oil and gas and mining concessions, nuclear power plant retirements, and lost income from power plant outages.

What we're watching in 2020 and beyond

The energy industry transition will continue into 2020 and beyond. Here are some of the major storylines we will be following in 2020:

- How do Decarbonization, Decentralization, and Digitization evolve as key sources of risk or opportunity for electric utilities and major energy users? Resource planning approaches and portfolio strategies are becoming more complex as traditional approaches (like IRP) evolve to include decentralized resources and their value to the transmission and distribution system as non-wires alternatives. At the same time, digitization and big data are advancing the processing of customer information and helping to achieve operational visibility and situational awareness around decentralized resources. CRA consultants are helping utilities consider advanced planning and operational approaches with process road maps and cost-benefit frameworks to support investment plans and regulatory approval processes.
- What effect will climate policy have on the earnings of gas utilities and midstream companies? What strategic alternatives can help companies address the physical and commercial risks associated with the climate impacts of their operations? To what extent will environmental, social, and governance (ESG) reporting become a key performance metric for the next-generation utility CFO?
- How will rapid changes in the energy resource mix affect mergers and acquisitions? As utilities close or sell off coal-fired generation, who will buy these resources? Potential buyers may have market-power issues related to the acquisition. Some financial players have purchased distressed or short-lived assets, while others have moved to policies of only holding "clean" assets. As utilities move toward hitting state or company renewable goals, how will deals be structured? We have observed long-term power purchase agreements, asset acquisitions, and leases as renewable generation resource options.
- How will energy storage deployment dynamics evolve as costs fall, new technologies become available, and barriers to market participation are removed? Implementation of FERC Order No. 841 in the US ISO/RTO markets is a key example of new market opportunities. Storage can be deployed at the transmission- and distribution-level to meet location-specific reliability needs at least cost to increase grid flexibility. CRA has been developing tools and working with clients to bring robust analytics to address these topics.

- What shape will capacity market reform efforts ultimately take in PJM? Will the courts support FERC's recent determinations, and when will PJM ultimately run its next several Base Residual Auctions? How will market dynamics and market prices shift in response to reform? Will states abide the Commission's position or withdraw from the PJM capacity market? We will be watching to see if stakeholders attempt to apply recent precedent to other markets.
- How will FERC's Order No. 569, which modified FERC's return on equity (ROE) methodology, affect transmission rates planning in 2020 and beyond? The Order replaced the earnings approach with a two-step methodology using discounted cash flow and capital asset pricing model metrics. In the methodology's first application, FERC approved a meaningfully lower ROE for transmission owners in MISO. Transmission owners may need to adjust to a new environment of potentially lower ROE levels. How should transmission owners plan for a potentially different ROE rate setting environment? What transmission rate setting approaches are best suited for a lower ROE environment?

Select publications

We are proud to highlight that CRA's [Seabron Adamson](#), and co-author Santosh Raikar, recently published a book entitled [Renewable Energy Finance: Theory and Practice](#), which integrates the special characteristics of renewable energy with key elements of project finance. Through a mixture of fundamental analysis and real-life examples, readers learn how renewable energy project finance works in actual deals that mix finance, public policy, legal, engineering, and environmental issues. The skills developed in analyzing non-recourse cash flow-based finance are applicable not only to green energy, but also apply more widely in project finance and infrastructure investing.

In December 2019, the CRA Energy Practice issued our inaugural [Utility & Energy Litigation Digest](#), which we hope will be a valuable resource for our clients to stay up-to-date on trending utility and energy litigation matters across North America. Watch for future editions of this publication to be available periodically. See our most recent issue [here](#).

Energy Practice economists and affiliated senior consultants continue to publish white papers and articles for our clients in academic and industry journals and trade publications. [Click here for the full listing](#) of articles, papers, and newsletters from 2019. Below, we highlight several publications:

[Utility resource implications for a 100% clean energy future](#)

Patrick Augustine, Anant Kumar, Clare Everts

[Energy storage as a transmission asset in regional markets](#)

Derya Eryilmaz, Caroline Heilbrun, *Energy Law 360*

[FERC directs PJM capacity market reforms: Progress but not certainty](#)

David E. Hunger, Patrick Augustine, Jeff Plewes, Jordan Kwok

[LNG market trends – Asian LNG market development](#)

Christian Jeffery, Herb Rakebrand, Laura Sochat

[Impact of climate change policies on the utility business model](#)

Enrique Glotzer, Herb Rakebrand

Addressing capacity performance risk for variable energy resources

Jeff Plewes, Jordan Kwok

Tackling the storage value stack: Wholesale market revenue streams

Patrick Augustine, Jordan Kwok, Parag Nathaney

Hydrogen: More than just a pipe dream

Colin Johnson, E Wah Wan, David Yu Bai

Dynamic electricity pricing – modeling manufacturer response and an application to cement processing

Derya Eryilmaz, *Energy and Environment Research*

Transparency in long-term electric demand forecasting: a perspective on regional load forecasting

Derya Eryilmaz

RTO board members share views on oversight role

Howard Schneider, *RTO Insider*

Strategic considerations for pipelines and utilities in a “green” regulatory environment

Herb Rakebrand

Beyond greenwash: a supermajor renewable portfolio challenge

Simon Ede, E Wah Wan

LNG market trends - a deeper dive

Herb Rakebrand, Christian Jeffery, Laura Sochat

PJM states: Enhancing communications and Is it time for states to become voting members of PJM?

Howard Schneider

Rethinking Canadian oil and gas investments amid shifting political and market realities

Herb Rakebrand

Speaking engagements and conferences

Energy Practice economists and experts spoke at numerous conferences and seminars in 2019 and hosted several events for clients and the energy community.

At the Gulf Coast Power Association’s 33rd Annual Spring Conference & Exhibition, **David Hunger** discussed the evolution of the Western Energy Imbalance Market, including local market power and transmission constraints in certain regions of the west. Dr. Hunger also presented on similar topics at the Joint CREPC-WIRAB Meeting to an audience of state regulators from the western US about changes in western wholesale electricity markets and their associated impact on state retail markets.

Jim McMahon and **Patrick Augustine** spoke at the Bank of America Merrill Lynch 2019 Power, Gas and Solar Leaders Conference on “The Path to Utility System Modernization: IRPs, Legislation, & Other Progressive Approaches.” The session included an interactive discussion about major changes in generation and distribution planning, with a particular focus on IRP-driven electric utility capital investment trends.

Patrick Augustine and Clare Everts presented on “Evaluating Costs and Risks of Emerging Technologies in Resource Planning” at the Electric Market Forecasting Conference, hosted by Energy Exemplar. Mr. Augustine and Ms. Everts explored comparative cost and dispatch risk profiles for a range of generating technology alternatives and discussed how to assess stochastic model inputs and non-traditional value of flexible resources in a planning context.

At the EEI Strategic Issues Roundtable, **Jim McMahon** spoke along with Chris Krygier, Director Operations at Liberty Utilities about how utilities are rethinking integrated resource planning. Jim and Chris reviewed utility activities across several states and discussed innovative approaches to utility resource investment, including Liberty’s distributed storage pilot and de-carbonization pathways.

Jim McMahon, **Bob Lee**, and **Patrick Augustine** conducted a half-day workshop at the EUCI Integrated Resource Planning (IRP) Summit on “Developing Supply-Side Resource Assumptions for an IRP.” The speakers addressed best practices for running an RFP as part of an IRP process, including RFP design, bid evaluation, and engagement with stakeholders and regulators. The session included a case study of CRA’s support for NIPSCO’s IRP. The CRA panelists were joined by Fred Gomos, Manager of Corporate Strategy at NiSource. At the same conference, **Jim McMahon** and **Patrick Augustine** presented CRA’s perspectives on “Accounting for Non-Traditional Resources Options” in an IRP, drawing on client experience with NIPSCO and Liberty Utilities.

Jim McMahon and **Patrick Augustine** hosted a webinar on the topic of **Incorporating Storage in the IRP: Emerging Planning Considerations**. The webinar discussed resource planning case study examples illustrating the storage value stack, the role of storage in mitigating long-term customer cost risk, and considerations for the role of storage in a deeply decarbonized future.

Dr. Derya Eryilmaz presented at Fredrikson’s “Renewable Energy in the Midwest” conference on the economic analysis of energy efficiency and distributed energy resource integration in MISO and implications for regional load forecasting. She presented novel approaches to load forecasting that should be considered as the energy industry evolves.

For the Energy Bar Association’s Northeast Chapter Annual Meeting, **Jeff Plewes** participated in a panel discussion of “State Policies and the Markets,” focusing on capacity market developments in the NYISO market.

Herb Rakebrand spoke at the Law Seminars International (LSI) Energy Seminar on a panel called “Renewable Energy In New England.” He discussed the impacts of climate initiatives on natural gas markets and the risks and opportunities for utility companies. At the Gas Pipeline Competition Model (GPCM) Users Conference, Mr. Rakebrand presented on the impacts of climate legislation on gas markets and how market consumption trends would impact network modeling approaches.

David DesLauriers was lead instructor in a two-day interactive seminar hosted by EUCI, “FERC Electric Transmission Ratemaking Seminar.” He focused on emerging rate design topics and rate setting techniques for electric transmission. Stanford University plans to use some of the course materials in its Electricity Economics course offered through its Civil and Environmental Engineering Department. Mr. DesLauriers also spoke at EUCI’s Net Metering Summit on the topics “Net Energy Metering – Spotlight on State Regulatory Actions” and “Implications for Change in Net Metering and DER Rate Design,” where he shared his expertise on emerging rate design topics for distributed resources.

Our London colleagues **Christian Jeffery** and **Knight Sukthaworn** spoke on “Energy Flexibility and Storage” at the Warwick Energy Security Forum. Mr. Jeffery focused on the future role of LNG in the UK supply mix amid declining gas production in the UK Continental Shelf, and the implications of increased reliance on LNG to secure future supply. Mr. Sukthaworn covered the previous roles of gas in UK electricity production and future challenges for gas-fired generation in the market. **Simon Ede** and **Diana Jackson** spoke at the CompLaw Competition Law & Regulation in the Energy Sector in Brussels on the changing nature of competition in the energy sector and its impact on energy sector regulation models and competition policy. **Simon Ede** and **Christian Jeffery** also presented at the Arbitration Club, discussing European natural gas price reviews, lessons learned for future LNG price reviews in Asia, and risks and conflicts that may stem from resource nationalism and climate change policy.

New colleagues and notable promotions

This year, we were pleased to announce the promotion of **Edo Macan** to Vice President. Mr. Macan has been with CRA as an energy economist since 2013, with a recent emphasis on providing economic consulting on market power issues for electric utility mergers and acquisitions, market-based rate authority applications, and market manipulation cases. Mr. Macan also has extensive experience with quantitative analysis of energy markets, especially in power and natural gas, with a focus on investment valuation, energy trading, and risk management.

We also welcomed two new colleagues to our senior team. **David DesLauriers** joined us from Black & Veatch Management Consulting, where he was a Director in the Energy Advisory and Planning practice. Mr. DesLauriers advises executive management of investor-owned utilities on rates and pricing, regulatory affairs and strategy, rate design, revenue requirements, cost of service and cost allocation, and regulatory compliance and market planning topics. He has provided expert testimony on issues such as utility cost of service, rate design, and regulatory policy and compliance matters to the Federal Energy Regulatory Commission, and in state and Canadian provincial jurisdictions. **Anant Kumar** joined us from Siemens Energy Business Advisory (Pace Global), where he was Principal and Head of Strategy and Planning Practice. Mr. Kumar has provided market and commercial advisory services to financial and strategic investors on acquisition, sale, and financing of renewable and thermal power generation assets. He has also advised investor-owned utilities and public power entities on integrated resource planning filings and broader strategic planning initiatives.

About CRA's Energy Practice

Charles River Associates is a leading global consulting firm that offers strategic, economic, and financial expertise to major corporations and other businesses around the world. CRA's Energy Practice provides services to a wide range of industry clients, including utilities, ISOs, RTOs, large customers, and investors. The Energy Practice has offices in Boston, New York City, Washington, DC, Toronto, and London. Learn more at www.crai.com/energy.

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