Company: San Diego Gas & Electric Company (U 902 M)
Proceeding: 2020 Cost of Capital
Application: A.19-04-XXX
Exhibit No.: SDG&E-05

# SAN DIEGO GAS & ELECTRIC COMPANY
# PREPARED DIRECT TESTIMONY OF
# CONCENTRIC ENERGY ADVISORS
# WILDFIRE RISK PREMIUM

**PUBLIC VERSION**

## BEFORE THE PUBLIC UTILITIES COMMISSION
## OF THE STATE OF CALIFORNIA


**APRIL 2019**

Company: San Diego Gas & Electric Company (U 902 M)
Proceeding: 2020 Cost of Capital
Application: A.19-04-XXX
Exhibit No.: SDG&E-05 Chapter 1

# SAN DIEGO GAS & ELECTRIC COMPANY
# PREPARED DIRECT TESTIMONY OF JOHN J. REED
# AND JAMES M. COYNE
# CHAPTER 1

**PUBLIC VERSION**

## BEFORE THE PUBLIC UTILITIES COMMISSION
## OF THE STATE OF CALIFORNIA


**APRIL 2019**

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EXHIBITS

## I. INTRODUCTION

**Q. Please state your names, affiliation, and business address.**

A. My name is John J. Reed. I am Chairman and Chief Executive Officer ("CEO") of Concentric Energy Advisors, Inc. ("Concentric") and CE Capital, Inc.

My name is James M. Coyne, and I am Senior Vice President of Concentric Energy Advisors, Inc.

Concentric is a management consulting and economic advisory firm, focused on the North American energy and water industries. Based in Marlborough, Massachusetts, and Washington, D.C., Concentric specializes in regulatory and litigation support, financial advisory services, energy market strategies, market assessments, energy commodity contracting and procurement, economic feasibility studies, and capital market analyses.

CE Capital is a fully-registered broker-dealer securities firm and FINRA member.

Our business address is 293 Boston Post Road West, Suite 500, Marlborough, MA 01752.

**Q. On whose behalf are you testifying?**

A. We are submitting this testimony on behalf of San Diego Gas & Electric Company ("SDG&E" or the "Company"), a subsidiary of Sempra Energy ("Sempra"), a publicly-traded holding company.

## II. QUALIFICATIONS

**Q. Mr. Reed, please describe your educational background and professional experience in the energy and utility industries.**

A. I have more than 40 years of experience in the energy industry and have worked as an executive in, and consultant and economist to, the energy industry. Over the past 30 years, I have directed the energy consulting services of Concentric, Navigant Consulting, and Reed Consulting Group. I have served as Vice Chairman and co-CEO of the nation's largest publicly-traded consulting firm and as Corporate Economist for the nation's largest gas utility (Southern California Gas Company). I have provided regulatory policy and regulatory economics support to more than 100 energy and utility clients and have provided expert testimony on regulatory, economic, and financial matters on more than 150 occasions before the Federal Energy Regulatory Commission ("FERC"), Canadian regulatory agencies, state utility regulatory agencies, various state and federal courts, and before arbitration panels in the United States and Canada. I have also been involved in numerous utility acquisitions, mergers and asset sales over the past 20 years and have advised clients in these assignments on utility valuations, due diligence matters, risk issues, financing, capital market access, credit rating matters, and the structure and execution of competitive sales processes. As CEO of CE Capital, I hold a number of securities licenses and am fully licensed to engage in investment banking activities, and the sale of all types of securities. I am a graduate of the Wharton School of Business at the University of Pennsylvania, and previously attended the

University of Kansas. My background is presented in more detail in Exhibit SDG&E-Concentric-1 to my testimony.

**Q. Mr. Coyne, please describe your educational background and professional experience in the energy and utility industries.**

A. I am among Concentric's professionals who provide expert testimony before federal, state and Canadian provincial agencies on matters pertaining to economics, finance, and public policy in the energy industry. This work includes calculating the cost of capital for the purpose of ratemaking and providing expert testimony and studies on matters pertaining to rate policy, valuation, capital costs, and performance-based regulation. In addition, I work for regulators, utilities, and independent developers on issues pertaining to the management and development of power generation, distribution, and transmission facilities. I have authored numerous articles on the energy industry, lectured on utility regulation for regulatory commission staff, and provided testimony before FERC as well as state and provincial jurisdictions in the U.S. and Canada. I hold a B.S. in Business Administration from Georgetown University and a M.S. in Resource Economics from the University of New Hampshire. My educational and professional background is summarized more fully in Exhibit SDG&E-Concentric-1 to my testimony.

**Q. Have you previously testified on utility financial matters, capital market issues, valuations, and the cost of capital before regulatory commissions?**

A. Yes. Both of us have testified extensively on these issues for regulated utilities and other parties in numerous proceedings. This testimony has

covered a broad range of issues ranging from traditional cost of capital models and resulting recommendations for Return on Equity ("ROE") and capital structure, to corporate and asset valuations, evaluations of business and financial risk and specialized applications to higher-risk businesses. We have testified in hundreds of cases in North American proceedings on energy industry financial matters for electric, gas, or electric transmission companies. A summary of our collective testimony experience is provided in SDG&E-Concentric-2. However, our work goes well beyond providing expert testimony, and involves advising energy industry clients across North America on financial matters, often involving the commitment of hundreds of millions to tens of billions of dollars. This work provides us with very broad exposure to and experience with the development of investment hurdle rates, risk assessments and expected returns both within and outside of the ratemaking process.

## III. PURPOSE AND OVERVIEW OF TESTIMONY

**Q. What is the purpose of your Direct Testimony?**

A. The purpose of our Direct Testimony is to present evidence and provide a recommendation regarding the risk premium applicable to SDG&E's authorized ROE. This risk premium is attributable to the Company's unmitigated financial exposure to wildfires.[1] We have calculated this risk

[1] In this Testimony we refer to "unmitigated" wildfire risk in financial terms, reflecting the residual exposure to shareholders under the current California regulatory and legislative framework. We recognize that SDG&E has taken steps to limit the likelihood of and damage caused by wildfires, and those mitigation measures are factored into our analysis.

premium above the ROE recommended by Dr. Morin, which is based on a traditional proxy-group based cost of equity analysis.[2]

California's utilities are operating in a unique environment with elevated planning, operating, and financial risks. The recurrence of devastating wildfires and risks associated with inverse condemnation require special consideration in the rate setting process. There is almost no precedent for a utility facing this degree of financial risk. Traditional approaches to the cost of capital for utility ratemaking, which rely heavily on "comparable" utilities' market data – and that assume that past non-diversifiable risk is indicative of future risk – is inadequate for these circumstances. We propose to address the cost of capital issues in this proceeding with a comprehensive approach to the examination of cost of capital, informed by the traditional approaches used by Dr. Morin, while also examining the unique risks facing SDG&E's equity investors. Our analyses and recommendations are supported by the data presented in Exhibit SDG&E-Concentric-3 to this testimony, which has been prepared by us or under our direction.

**Q. What is your conclusion regarding the required wildfire risk premium for the Company?**

A. We have conducted an analysis of the extraordinary wildfire risks faced by SDG&E and estimated the resulting impacts on its cost of equity. The

[2] *See* Prepared Direct Testimony of Roger A. Morin, PhD., Return on Equity (April 2019) ("Ex. SDG&E-04 (Morin)").

wildfire risks facing SDG&E and the other California electric utilities are the direct result of the devastating California wildfires and the potential imposition of the resulting liabilities on shareholders. Depending on the method, our analysis identifies a wildfire risk premium in the range of 1.87 to 6.50 percent. We ultimately conclude that a risk premium of 3.4 percent best represents the wildfire risk currently borne by SDG&E's shareholders. The results of our analyses are presented in Exhibit SDG&E-Concentric-3, accompanying this testimony.

Our estimated risk premium reflects the current state of legal, regulatory, and financial issues that pertain to the portion of SDG&E's unmitigated risk of wildfire liabilities. It is our understanding that there are several potential legislative and regulatory solutions that may ultimately reduce the risk of wildfire liabilities to California's utilities. Any remedies that mitigate that risk must be analyzed to determine the degree to which they reduce investors' return requirements.

**Q. Please provide a brief overview of the analyses that you conducted to support your wildfire risk premium recommendation.**

A. Our recommendation is based on the analyses produced from multiple alternative approaches designed to measure greater shareholder risk generally, and the specific wildfire risks of SDG&E, and the impacts of these risks on SDG&E's cost of equity. These approaches are based on economic and financial theory, market data (where available), and tools familiar to the California Public Utilities Commission ("CPUC" or "Commission") where possible. We are mindful that the typical cost of

capital models and approaches relied upon by the Commission are ill-suited for these extraordinary circumstances. We also recognize that most market data for California's utilities are "biased" by the market's expectation that the California legislature or Commission will act to mitigate these risks for California's utilities. We further recognize that the current level of risk for California's electric utilities represents essentially "uncharted waters." Our challenge is to work with these approaches and tools and look for confirmation from alternate sources to gauge an appropriate risk adjustment.

We have examined six methods to estimate the appropriate risk adjustment and resulting cost of equity for SDG&E:

1. an industry risk assessment for a range of high-risk industries, indicating the market-required compensation for capital at risk (even though these risks are symmetrical for these industries, in contrast to SDG&E's one-sided wildfire risk);
2. an analysis of recent stock declines for California utilities, and an examination of the earnings and dividends necessary to restore shareholders to their pre-wildfire rate of returns;
3. an Estimated Loss Approach based on a probabilistic estimate of wildfire liabilities and the required ROE premium necessary to offset the earnings loss;

4. an Insurance Approach, which examines the costs to insure against the current shareholder portion of the Company's wildfire risks, relying on recent insurance costs;
5. A CAT Bond Approach, relying on the market for catastrophic ("CAT") insurance bonds for California's utilities – with both the Insurance Approach and CAT Bond Approach indicating the cost of placing the risk with a third party; and
6. the incremental return on equity required to restore SDG&E's credit rating to its pre-wildfire level if the risks are left as currently allocated.

We understand that under ordinary circumstances, ROE models are tools to be used in the ROE estimation process, and that strict adherence to any single approach, or the specific results of any single approach, can lead to flawed conclusions. No model can exactly pinpoint the correct return on equity. Instead, each approach brings its own perspective and set of inputs that inform the estimate of ROE. Therefore, our analysis considers the range of results produced by these six methods.

Our recommendation is ultimately derived from the Estimated Loss, Insurance, and CAT Bond Approaches. In our view, these Approaches most reliably indicate the incremental cost of equity for SDG&E for its risks that are not reflected in Dr. Morin's analysis for the proxy group utilities.

**Q. Have you relied upon the testimonies of other Company witnesses in developing your evidence?**

A. Yes. We have relied upon the testimony of Dr. Morin (Exhibit SDG&E-04) for his recommendation of an appropriate ROE based on standard approaches, the testimony of Todd Shipman (Exhibit SDG&E-05, Chapter 2), who has assessed the impacts of wildfire risks on the California utilities' credit ratings, along with other testimony served concurrently in this proceeding by SDG&E.

**Q. How is the remainder of your Direct Testimony organized?**

A. The remainder of our Direct Testimony is organized as follows:

Section IV briefly describes the guiding principles used in establishing the cost of capital for a regulated utility, the standards applied in, and precedent for, determining the cost of capital for California's utilities.

Section V considers the additional factors that must be considered when determining the Company's cost of equity and uses several approaches to estimate an appropriate risk premium.

Section VI discusses potential resolutions to mitigate the Company's financial exposure to wildfire liability risks.

Section VII summarizes our results, conclusions, and recommendation.

## IV. REGULATORY PRINCIPLES AND CALIFORNIA PRECEDENT

**Q. Please describe the guiding principles used in establishing the cost of capital for a regulated utility.**

A. The foundations of public utility regulation require that utilities receive a fair rate of return sufficient to attract needed capital to maintain important infrastructure for customers at reasonable rates. The basic tenets of this regulatory doctrine originate from several bellwether decisions by the United States Supreme Court, notably *Bluefield Water Works & Improvement Co. v. Pub. Serv. Comm'n of W. Va.*, 262 U.S. 679 (1923) ("*Bluefield*"), and *Fed. Power Comm'n v. Hope Nat'l Gas Co.,* 320 U.S. 591 (1944) ("*Hope*"). These standards are discussed in the direct testimony of Bruce Folkmann (Exhibit SDG&E-01) and Dr. Morin, and we agree with their presentation of those standards.

**Q. Does the CPUC abide by these same standards?**

A. Yes. The CPUC references these same legal standards in setting the cost of capital for utilities under its jurisdiction. In doing so, the Commission summarizes:

> We attempt to set the ROE at a level of return commensurate with market returns on investments having corresponding risks, and adequate to enable a utility to attract investors to finance the replacement and expansion of a utility's facilities to fulfill its public utility service obligation. To accomplish this objective, we have consistently evaluated analytical financial models as a starting point to arrive at a fair ROE.[3]

[3] Decision ("D.") 12-12-034 at 18; *see generally* D.18-03-035 at 6.

**Q. Please discuss how the cost of capital has previously been set by the Commission.**

A. The Commission has adopted a consolidated approach to establishing the cost of capital for California's major energy utilities. Each utility files a separate application, but the Commission generally consolidates these applications while still considering unique factors facing each utility. These decisions establish the test year authorized rate of return, including ROE, and capital structure individually for Southern California Edison Company ("SCE"), SDG&E, Southern California Gas Company ("SoCalGas") and Pacific Gas and Electric Company ("PG&E"). In this testimony, our focus is on the following California electric utilities: SDG&E, SCE, and PG&E (collectively "California Utilities" or "Utilities").

The CPUC's authorized ROEs over the past decade for the three Utilities are summarized below in Table 1.[4]

[4] California Public Utilities Commission, Cost of Capital Proceedings for the Major Utilities, *available at* http://www.cpuc.ca.gov/general.aspx?id=10458.

**Table 1: Authorized ROR and ROE for California's Major Electric Utilities**

| | Year | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **SCE** | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
| SCE Authorized ROE | 11.50% | 11.50% | 10.45% | 10.45% | 10.45% | 10.45% | 10.45% | 10.30% |
| SCE Authorized ROR | 8.74% | 8.74% | 7.90% | 7.90% | 7.90% | 7.90% | 7.90% | 7.69% |
| **PG&E** | | | | | | | | |
| PG&E Authorized ROE | 11.35% | 11.35% | 10.40% | 10.40% | 10.40% | 10.40% | 10.40% | 10.25% |
| PG&E Authorized ROR | 8.79% | 8.79% | 8.06% | 8.06% | 8.06% | 8.06% | 8.06% | 7.61% |
| **SDG&E** | | | | | | | | |
| SDG&E Authorized ROE | 11.10% | 11.10% | 10.30% | 10.30% | 10.30% | 10.30% | 10.30% | 10.20% |
| SDG&E Authorized ROR | 8.40% | 8.40% | 7.79% | 7.79% | 7.79% | 7.79% | 7.79% | 7.55% |

**Q. What methods has the Commission relied upon in reaching its cost of equity determinations?**

A. The Commission has placed reliance on the traditional proxy-based models commonly used for estimation of the cost of equity in regulatory proceedings: the Capital Asset Pricing Model ("CAPM"); the Risk Premium Model ("RPM"); and the Discounted Cash Flow ("DCF") Model. The Commission observed, however, that "[i]n the final analysis, it is the application of informed judgment, not the precision of financial models, which is the key to selecting a specific ROE estimate."[5]

**Q. Did the Commission reach certain conclusions in its 2012 Cost of Capital Decision that require re-examination in the current proceeding?**

A. Yes, there are findings from the Commission's 2012 cost of capital decision

[5] D.12-12-034 at 28.

that warrant reconsideration in light of the specific circumstances in this proceeding.

**A. Business Risk**

Under the topic of "Business Risk", the Commission noted in its 2012 decision:

> Business risk pertains to *new* uncertainties resulting from competition and the economy. An increase in business risk can be caused by a variety of events that include capital investments, electric procurement, and catastrophic events. Each of these business risks overlap into financial and regulatory risk. Capital investment risk is addressed in our subsequent authorized ROE risk discussion (Section 5.3.3.1.) and Electric procurement risk in our cost recovery risk discussion (Section 5.3.3.2.).
>
> SCE and SDG&E identified the 2007 Southern California wildfire as an example of a catastrophic event resulting in a need to further compensate investors through a higher ROE because of heightened perceived business risk. However, none of the credit agencies reporting on the creditworthiness of either SCE or SDG&E mentioned any risks associated with wildfires.
>
> While the anticipation of catastrophic events may expose investors to added risks, such events are not limited to California. These business risks are already captured in the parties' financial modeling results. Any upward adjustment to the financial modeling results being adopted due to business risks would be redundant and possibly excessive.[6]

As documented in this evidence, and that of Bruce MacNeil (Exhibit SDG&E-06), Don Widjaja (Exhibit SDG&E-03), and Mr. Shipman, the

[6] D.12-12-034 at 30 (footnotes omitted).

credit ratings for California's utilities have subsequently been significantly impacted by the wildfires. We will further demonstrate that the business risks captured by traditional utility proxy groups are no longer representative of the unique risks faced by the California's Utilities' shareholders.

**B. Regulatory Risk**

The Commission made several comments on regulatory risk that are particularly relevant today.

> Regulatory risk pertains to new risks that investors may face from future regulatory actions that we, and other regulatory agencies, might take. Regulatory risk assessment is also used by rating agencies to set utility bond ratings. Each of the utilities maintains an investment grade bond rating. For example, SCE has an S&P bond rating of BBB, SDG&E an A, SoCalGas an A, and PG&E a BBB. The A ratings are considered by S&P to be upper medium investment grade level and BBB to be medium investment grade level. These investment grade ratings are a good indication that California regulatory risks are low.

The Commission added:

> An authorized ROE has risk when it does not adequately compensate a utility for the risk that investors must assume. California is generally perceived as having a constructive regulatory environment.[7]

As measured by these standards, circumstances and risks for California's utilities have clearly changed. As documented by Mr. Widjaja

[7] *Id.* at 31 (footnotes omitted).

and Mr. Shipman,[8] PG&E is currently operating in bankruptcy, all of California's major electric utilities have been subject to rating downgrades, and both credit rating agencies and equity analysts are no longer signaling that California's regulatory environment is a "constructive regulatory environment."[9]

### C. California Wildfires and Inverse Condemnation

**Q. Please describe the risks that the California utilities face due to the wildfires.**

A. Wildfires present unique risks to the California investor-owned utilities for two main reasons. First, wildfires have become more frequent and larger in magnitude over time. Second, each time a California utility's equipment is involved in the ignition of a fire that creates economic damages, that utility may face enormous uninsured, and potentially unrecoverable, liabilities.

**Q. Please elaborate.**

A. Under California state law, a legal standard known as inverse condemnation applies when utility equipment is a cause of a wildfire ignition. This doctrine makes utilities strictly liable for liability damages caused by their own facilities, regardless of negligence and other causes.[10] These liabilities may include homeowner insurance claims, uninsured property damage

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[8] Prepared Direct Testimony of Don Widjaja, Company Risk, ("Ex. SDG&E-03 (Widjaja)") at 16 and Prepared Direct Testimony of Todd A. Shipman, CFA, Wildfire Risk Premium – Chapter 2 (April 2019) ("Ex. SDG&E-05, Ch. 2 (Shipman)") at 13.

[9] S&P Global Ratings, RRA Evaluation (February 5, 2019); S&P Global Ratings, Credit FAQ: Discusses the Multi-notch Downgrade of PG&E (January 11, 2019).

[10] *See Barham v. S. Cal. Edison Co.*, 74 Cal. App. 4th 744, 752 (1999).

claims, business interruptions, agricultural damages, emotional harm, personal injuries, and other losses. Yet the CPUC, to date, has not taken inverse condemnation or the cost-sharing purposes behind the doctrine into account in the agency's prudence review of utility requests to recover wildfire-related liability. These diverging standards leave California utilities potentially responsible for those liabilities.

After the 2007 Witch, Guejito, and Rice fires, SDG&E settled approximately $2.4 billion of the $4 billion in total damage claims. While SDG&E was able to offset that liability with an insurance reimbursement of $1.1 billion, settlements with third parties of $827 million, and FERC-authorized recovery of $80 million, the CPUC denied recovery of $421 million of wildfire costs incurred by SDG&E in the CPUC's Final Decision issued December 2017.[11]

**Q. What is the basis and estimate of the total exposure for California utilities?**

A. The losses incurred to-date and future potential liabilities are primarily due to how the courts and the CPUC have interpreted the doctrine of inverse condemnation. Without any changes in how inverse condemnation applies to utility wildfire liabilities, SDG&E faces substantial business and solvency risks in the future.

[11] *See* D.17-11-033. The total liability of SDG&E's California-jurisdictional operations totaled $421 million. After applying a voluntary Company contribution of 10%, or $42 million, the net amount was $379 million. None of these costs were deemed recoverable.

Recent events in other parts of California illustrate how financially catastrophic wildfires can be for investor-owned utilities. PG&E's transmission lines are suspected of igniting the 2018 Northern California wildfires. The California Department of Insurance has estimated plaintiff claims so far at $11.4 billion.[12] The company recognized in its bankruptcy filing that the total damage claims from fires could be more than $30 billion.[13]

Catastrophic wildfires also broke out in Southern California in 2017 and 2018. After numerous lawsuits, SCE took a charge for the fire liabilities and estimated the plaintiff damage claims at approximately $4.7 billion. After settlements, wildfire insurance reimbursements, and authorized FERC recovery, SCE's after-tax liability is approximately $1.8 billion.[14]

**Q. What is SDG&E's specific wildfire exposure and total potential liabilities?**

A. SDG&E's service territory includes San Diego County and parts of Orange County, which are prone to wildfire outbreaks. Overall, 57 percent of SDG&E's service territory is classified as High Fire Threat by the CPUC. These risks, as well as a map of SDG&E's high fire threat areas, are

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[12] California Department of Insurance, Insured Losses from the 2018 California Wildfires (January 28, 2019), *available at* http://www.insurance.ca.gov/0400-news/0100-press-releases/2019/upload/nr14-2019Insured-Losses-2018-Wildfires.pdf.

[13] *See* United States Securities and Exchange Commission, Pacific Gas and Electric Company Form 8-K, Bankruptcy or Receivership (January 13, 2019) at 4, *available at* https://www.pge.com/pge_global/common/pdfs/about-pge/company-information/reorganization/reorganization-8-K.pdf.

[14] Edison International, Press Release: Edison International Reports Fourth Quarter and Full-Year 2018 Results (February 28, 2019), *available at* https://newsroom.edison.com/releases/edison-international-reports-fourth-quarter-and-full-year-2018-results.

described in greater detail in the testimony of Mr. Widjaja (Exhibit SDG&E-03).

SDG&E's 2007 wildfires were not isolated occurrences. SDG&E's service territory has experienced several other significant wildfires since 2007, including the Bernardo, Cocos, and Poinsettia fires in May 2014, the Lilac Fire in December 2017, and the West Fire in June 2018. However, those fires were not linked to SDG&E equipment, so the utility did not incur any liabilities.

**Q. Has SDG&E attempted to mitigate the risk associated with wildfires in its service territory?**

A. Yes. As described in the testimonies of Messrs. Folkmann and Widjaja, we understand that SDG&E has engaged in a host of wildfire mitigation and prevention measures since SDG&E's 2007 wildfires. Most recently, in compliance with California legislation enacted in late 2018, SDG&E established a Wildfire Mitigation Plan ("WMP"), a comprehensive portfolio of SDG&E's mitigation programs and strategies. The programs and strategies set forth in the WMP, which will be requested for cost recovery as part of a future SDG&E general rate case, focus on system hardening, vegetation management, operational programs, situational awareness, and customer engagement. We recognize that SDG&E's WMP aims to mitigate potential ignitions and lessen the impacts should a fire occur (*i.e.*, response activities). It does not, however, address residual liabilities due to wildfire given the legal doctrine of inverse condemnation.

**Q. Can insurance products mitigate the financial exposure to these risks?**

A. Yes, to a point. SDG&E currently has approximately $1.5 billion in insurance and bond coverage for wildfire-specific liabilities. SDG&E's ability to purchase insurance at a reasonable cost is influenced by several factors, including state policy and future frequency of wildfires.

**Q. What if the wildfire liabilities exceed the Company's insurance coverage?**

A. Any loss that exceeds the level of insurance coverage is subject to potential recovery in a regulatory process, either at the CPUC or FERC. But recovery through these processes is subject to significant uncertainty and timing challenges. This level of exposure is what we have labelled as SDG&E's unmitigated financial risk.

**Q. What Legislative actions have been taken to address this issue?**

A. In August 2018, California passed Senate Bill 901 ("SB 901"), which introduced a series of changes relevant to investor-owned utilities but did not change the doctrine of inverse condemnation.

**Q. Does SB901 help mitigate the risk for the Utilities?**

A. At this time, it is not clear how the CPUC will apply SB 901 and how this legislation will impact the California Utilities' ability to recover certain costs and expenses in cases where a utility's equipment is determined to be a cause of a fire.

**Q. How are financial market analysts interpreting the legislative actions?**

A. In its September 6, 2018 report, Moody's noted that SB 901 offers some constructive tools for the CPUC to use going forward in conducting its reasonableness review when considering whether to allow the California Utilities to recover catastrophic wildfire related costs.[15]

S&P indicated that SDG&E's negative outlook reflects its view that it may further lower the Company's rating if the severity of California's wildfires persists without a longer-term reform to inverse condemnation. S&P additionally noted that it could lower SDG&E's credit rating within the next two years if the CPUC interprets SB 901 in a manner that does not limit the risks to the California Utilities.[16]

**Q. What is the status of recovery of wildfire liabilities at FERC?**

A. FERC authorized SDG&E to recover the FERC-jurisdictional portion of the costs arising from the 2007 wildfires. For instance, after the 2007 wildfires, FERC used a labor allocator of 16 percent to determine that SDG&E could recover $80 million (of the $501 million in net liabilities) through transmission rates.[17] Notably, the CPUC did not allow any recovery of these same costs.

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[15] *See* Moody's Investors Service, Moody's downgrades San Diego Gas & Electric to A2 from A1; outlook stable (September 6, 2018) at 1.

[16] *See* S&P Global Ratings, San Diego Gas & Electric Co. Downgraded to 'A-' on Unaddressed Longer-Term Wildfire Risks; Outlook Negative (September 5, 2018).

[17] The Company's current labor allocator is 18.4 percent.

**Q. How is this situation different in California than in other states?**

A. Utilities in other states are not subject to the same level of catastrophic wildfire risk as the California Utilities. Nor do they face the same risks associated with recovery of the liabilities that California Utilities are subject to under the combination of the doctrine of inverse condemnation and the CPUC's reasonableness review. These risks are unique to the California Utilities. In the following section, we address the issue of whether the unique risks faced by California Utilities are, or can be, captured in the traditional financial models used to determine the cost of capital.

## V. ESTIMATES OF THE EQUITY RISK ADJUSTMENT FOR WILDFIRE LIABILITY RISK

**Q. How is the required ROE determined for SDG&E?**

A. Several models have been developed to estimate the cost of equity, and Dr. Morin has used multiple approaches to estimate the cost of equity for the average utility and SDG&E. As a practical matter, all the models available for estimating the cost of equity are subject to limiting assumptions or other methodological constraints.

In the analytical approaches Dr. Morin applies to estimate the cost of equity, he has relied on a proxy group that is representative of the average utility industry risk profile nationwide. However, additional factors must be taken into consideration when determining the Company's cost of equity relative to the proxy group, given the unique risks facing California Utilities. Dr. Morin's proxy group does not include any other companies that are subject to the same level of catastrophic wildfire risk as the

Company,[18] nor the risk associated with inability to recover liabilities that California Utilities are subject to under the doctrine of inverse condemnation.

**Q. How have you estimated the risk associated with the liabilities related to catastrophic wildfires for SDG&E?**

A. We have used multiple approaches based on market data to estimate how investors and third parties view the incremental risk for liabilities associated with catastrophic wildfires. To the extent possible, we have considered the analytical methodologies Dr. Morin applies in developing his ROE estimate and considered those risks outside of Dr. Morin's applied proxy group. We have also considered other available market data that provide a meaningful estimate of the premium investors would require to make an equity investment in the Company, given the substantial level of unmitigated financial risks associated with catastrophic wildfires. Specifically, we have considered: (1) an industry-risk approach to understand the risk premiums reflected across a spectrum of industrial risk levels; (2) a stock price decline approach that looks at the recent stock performance of the California Utilities; (3) the estimated loss to SDG&E based on probabilistic estimates of wildfire events and the return premium required to compensate investors for these losses; (4) costs from the insurance market that indicate the

18 While Dr. Morin's proxy group includes Sempra, this is but one of 17 companies in the group. Further, the Company's CPUC jurisdictional operations represent only 19 percent of Sempra's total assets across its diversified holdings. Sempra's other business segments are not subject to the same catastrophic wildfire risks, and therefore have a different risk profile than the Company. In effect, Sempra's cost of equity represents a combination of those risks, and the benefits of diversification.

required premium to place wildfire risk with a third-party; (5) costs from the CAT bond market for California's Utilities; and (6) the incremental return on equity required to restore SDG&E's credit rating to its pre-wildfire level.

**A. Industry Risk Approach**

**Q. Please briefly describe your Industry Risk approach.**

A. As described in more detail by Dr. Morin, the CAPM is a risk premium approach that estimates the cost of equity for a given security as a function of a risk-free return plus a risk premium to compensate investors for the non-diversifiable or "systematic" risk of that security. This second component is the product of the market risk premium and the Beta coefficient, which measures the relative riskiness of the security being evaluated. The CAPM model can reflect an alternative Beta coefficient that represents the risks associated with an investment that is significantly riskier than the typical utility reflected in Dr. Morin's proxy group. The use of alternate Betas to reflect greater risks is the focus of our Industry Risk approach.

**Q. Have you considered what Beta coefficient would represent the risk premium associated with catastrophic wildfires?**

A. Yes. Dr. Morin has presented a CAPM analysis with a Beta coefficient of 0.60 for his proxy companies. This Beta coefficient represents the average utility risk. Since the risk of catastrophic wildfires represents an incremental risk relative to the average utility company, the appropriate

Beta coefficient that captures that risk must be higher than that for the average utility. The full range of utility proxy group Beta coefficients is an inadequate risk measure when we are estimating the risk associated with catastrophic wildfires, because no member of that proxy group reflects the level of wildfire risk that is borne by SDG&E's shareholders. Therefore, we have expanded our risk assessment to include other industries.

**Q. What is the range of Beta coefficients in other industries that represent higher risks?**

A. To estimate the spectrum of potential risk premia that can be applied to the Company, we analyzed the Beta coefficients for all companies that are included in the Value Line universe and report a Beta coefficient through the Screener. There are more than 5,000 companies grouped into approximately 100 industries. Utility companies, along with the Thrift (Savings and Loan) industry, are at the low end of the spectrum with median Beta coefficients generally in the range of 0.55 to 0.60. Some industries tend to perform in-line with the market, for example, Information Services, Entertainment, and Life Insurance industries have a median Beta coefficient of approximately 1.00. Capital-intensive industries such as Oilfield Services and Equipment, Natural Gas (Diversified Operations), Petroleum (Producing), Maritime, and Steel industries represent the high-end of the spectrum. The median Beta coefficients for these industries range from 1.35 to 1.55.

**Q. What is the range of risk premia that would be required to invest in these riskier industries relative to the average utility company?**

A. Investing in a company that performed in-line with the broader market, assuming a Beta coefficient of 1.00, would require a risk premium over utilities of 276 basis points.[19] At the high-end of the range, investing in an industry like Oilfield Services or Steel would require a risk premium of 518[20] basis points to 656[21] basis points.

However, even this range of estimates will not fully capture the risk profile of a utility that, like SDG&E, is subject to catastrophic wildfire risks. Such companies are exposed to the potential of massive losses due to liabilities that may exceed the value of the utilities' equity, representing a significant downside risk that is essentially unbounded. Wildfire financial risk is also entirely one-sided. While it represents an extraordinarily large downside risk, there is no upside opportunity associated with this risk. Other industries tend to have more symmetrical risks. For example, an oilfield services company is exposed to the potential for substantial losses if significant investments are made and potential revenues are never realized. However, a company in that industry that is successful is not bounded in its upside potential and thus may realize substantial profits. Therefore, it is reasonable to assume that the risk premium discussed above

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[19] (6.90% x (1.00 – 0.60)) = 2.76, where 6.9% is the market risk premium (Rm – Rf) and 1.00 and 0.60 are the betas for the market and utilities, respectively.

[20] (6.90% x (1.35 – 0.60)) = 5.18, where 6.9% is the market risk premium (Rm – Rf) and 1.35 and 0.60 are the betas for oil field services and utilities, respectively.

[21] (6.90% x (1.55 – 0.60)) = 6.56, where 6.9% is the market risk premium (Rm – Rf) and 1.55 and 0.60 are the betas for the steel industry and utilities, respectively.

for SDG&E would have to significantly increase from that observed in a similar industry with symmetric risks (perhaps as much as twice that for symmetric risk).

**Q. What is your conclusion regarding your industry risk analysis?**

A. It is difficult to determine a point estimate based on a review of other non-utility industries, as there is no directly comparable industry that is rate-regulated and exposed to a one-sided risk similar to potentially unrecoverable catastrophic wildfire liabilities. Nonetheless, the review of other industries informs the spectrum of risk premia available to investors. We conservatively peg the one-sided wildfire risk at 275-600 basis points over the required return for an average utility. For that reason, we consider this analysis to be one that can only provide a "ranging" analysis as opposed to a point estimate.

**B. Implied Risk From Recent Stock Declines**

**Q. Please describe your analysis of recent stock price declines for California's electric utilities.**

A. Stock prices and projected dividends are the key elements of the traditional DCF model used to estimate the cost of equity. DCF models are widely used in regulatory proceedings. In its simplest form, the DCF model expresses the cost of equity as the sum of the expected dividend yield and long-term growth rate. Dr. Morin includes this version of the DCF approach in his estimation of the average utility cost of equity.

For the purpose of estimating the risk of associated with catastrophic wildfires to California Utilities, the DCF approach presents limitations due to the lack of suitable proxy companies that capture the full risk premium. However, a fall in a stock price is an indication that investors require a higher return to invest in that stock. Therefore, stock price reductions can be a measure of incremental risk.

**Q. Does the Constant Growth DCF analysis of an average utility proxy group incorporate the risk associated with catastrophic wildfires?**

A. No, it does not. Much like the CAPM approach, the risk of catastrophic wildfires represents an incremental risk relative to the average utility company.

**Q. What companies did you consider in your analysis of stock price declines?**

A. Since we are estimating the cost of equity for a California utility, and more specifically estimating the risk premium associated with catastrophic wildfires for CPUC-jurisdictional operations, we can look to changes in stock prices for the California Utilities as investors have increased their return requirements over time. The CPUC's Wildfire Expense Memorandum Account ("WEMA") decision to deny the Company recovery of costs associated with SDG&E's 2007 wildfires[22] made it clear that investors could be subject to significant risks associated with wildfires. These risks include the liabilities under the doctrine of inverse

[22] *See* D.17-11-033.

condemnation, and the limited opportunity for cost recovery, even when there is no finding of negligence. In addition, the 2018 Northern California wildfires demonstrated the reality of the potential for a recurrence of catastrophic wildfires in the State. Therefore, looking at the California Utilities' respective stock prices prior to the CPUC's WEMA decision and the October 2017 Southern California wildfires, relative to recent results, provides an indication as to how investors view the incremental risk for potential losses associated with catastrophic wildfires.

**Q. Has Sempra's stock price changed since the WEMA decision?**

A. Yes, but these results have been affected by a number of other events. Since the WEMA decision, Sempra acquired Energy Future Holdings Corp., which includes a majority stake in Oncor Electric Delivery Company LLC. The $9.45 billion acquisition was a significant transaction that makes comparisons over this period impractical for Sempra since investors' expectations of Sempra are now based on the larger, more diversified holdings of Sempra relative to the smaller company at the time of the WEMA decision. Putting the transaction aside, the Company's CPUC-jurisdictional operations also represent only a portion of its total holdings, so any incremental risk to the CPUC-jurisdictional segment would be limited to that portion of the Company in a sum-of-the-parts analysis. As such, Sempra's stock price performance does not capture the full risk premium associated with catastrophic wildfires to California utilities.

**Q. How has Edison International's stock price performed since October 2017?**

A. Edison International's primary operating subsidiary is Southern California Edison, which operates exclusively in the State of California. In this analysis, we are not making a determination as to whether or not Edison International is a suitable proxy for the Company's ROE. However, the relative change in Edison International's valuation since the WEMA decision and the October 2017 Southern California wildfires demonstrates how investors' requirements have changed.

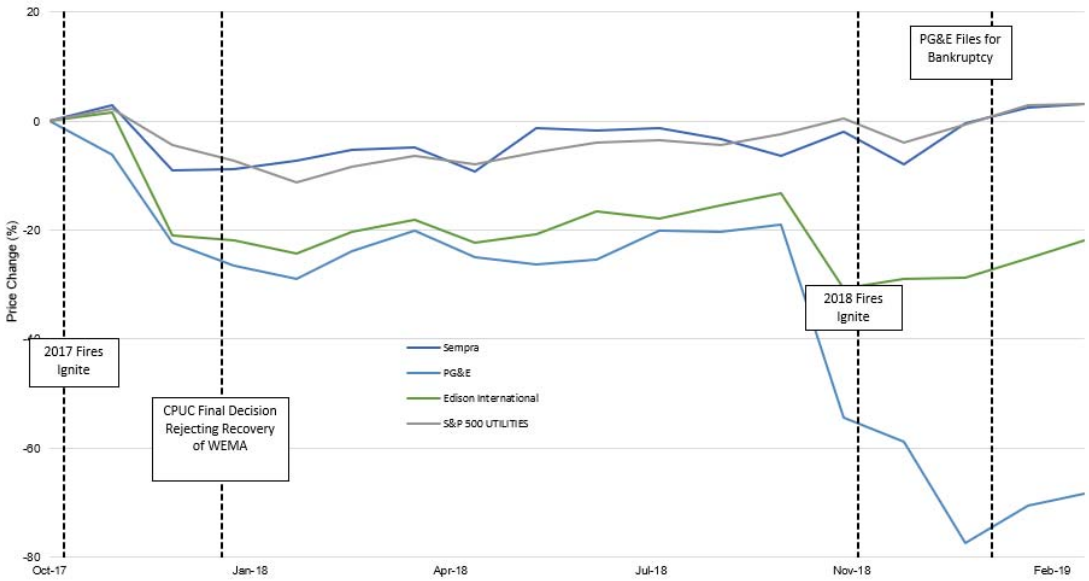
As shown in Exhibit SDG&E-Concentric-3, page 3 to this testimony, Edison International's stock price has declined more than 20 percent from approximately $80 per share in September 2017 to less than $64 per share in March 2019. Part of this decline can be attributed to the specific claims arising from the wildfires that occurred in 2017-18 in Southern California Edison's service territory. For that event, the losses expected to be borne by Edison International's shareholders are $5.60 per share,[23] or approximately 7 percent of its September 2017 share price. Over that same period, the utility industry stock prices, as measured by the S&P 500 Utility Index, have increased by more than 6 percent, suggesting that Edison International's recent performance has meaningfully deviated from the average utility performance. Therefore, investors have already priced

[23] Edison International, Press Release: Edison International Reports Fourth Quarter and Full-Year 2018 Results (February 28, 2019), *available at* https://newsroom.edison.com/releases/edison-international-reports-fourth-quarter-and-full-year-2018-results. .

into Edison International's stock price the effect of the loss associated with the 2017-18 wildfire liabilities. The continued underperformance of Edison International's stock price relative to average-risk utilities is likely due to the risk of future wildfire liabilities. However, the underperformance is moderated by investors' expectation that a regulatory or legislative resolution will mitigate the California Utilities' exposure to wildfire liabilities. For example, a recent Bank of America Merrill Lynch report upgraded its rating for Edison International "seeing an improving awareness from wider CA stakeholders to address the wildfire liability construct in the state this year, potentially allowing for a recovery in EIX shares"[24] Since Edison International's stock has priced in a likelihood of some form of legislative, regulatory or other relief to catastrophic wildfire risks, it does not reflect the full exposure to wildfire liabilities absent relief. Therefore, Edison International's stock price also does not reflect the total exposure to risks associated with catastrophic wildfires.

[24] Bank of America Merrill Lynch, Edison International, A bit more confidence in California: Upgrade to Neutral (March 1, 2019).

**Figure 1: California IOUs Stock Price Change Since October 2017**




**Q. What does the stock price analysis suggest for the risk premium priced into Pacific Gas and Electric Corporation's ("PG&E Corp.") stock price?**

A. As shown in Exhibit SDG&E-Concentric-3, page 3 to this testimony, PG&E Corp.'s stock price has declined more than 70 percent from approximately $70 per share in September 2017 to less than $20 per share in March 2019. PG&E Corp. suspended its dividend in December 2017, citing uncertainty related to potential liabilities associated with the October 2017 Northern California wildfires. This fact is inconsistent with the premise of the traditional DCF model. Therefore, a DCF analysis of PG&E Corp. is not possible without certain hypothetical assumptions and adjustments. Nonetheless, the decline in PG&E Corp.'s stock price demonstrates that shareholders are expecting to bear a significant portion of the potential

liabilities from recent wildfires, and the ongoing incremental risk associated with future catastrophic wildfires.

**Q. Are these stock price declines representative of the full risk premium that would compensate investors for taking on the utilities' unmitigated wildfire risk?**

A. No, because equity markets have priced into the valuations of California utilities the assumption that some form of legislative, regulatory or other relief will be granted. For example, Morgan Stanley recently observed:

> The largest risk we see is the potential that California does not put in place a durable fix to the treatment of wildfire risk in the state, and the associated credit risk and threat to SRE's credit ratings. That said, we believe at least a partial fix is likely (we will describe in depth within this note), and we believe SRE's credit profile, including its financial metrics, is likely to be capable of supporting the company's ambitious growth plans.[25]

Despite the fact that SDG&E comprises only a fraction of Sempra's business segments, Morgan Stanley has identified risks associated with wildfire liabilities as the largest risk. Significantly, this risk is implicitly discounted as Morgan Stanley also states that some level of mitigation is "likely." At present, there have not been any significant remedies adopted for the California Utilities that would mitigate these financial consequences. But investors are presently making assumptions regarding the likelihood of an imminent remedy, and these inform their valuation estimates. If it becomes apparent that a regulatory or legislative remedy is not forthcoming,

[25] Morgan Stanley, Sempra Energy: Constructive Update Highlights Numerous Growth Opportunities (March 28, 2019).

investors would increase their return requirements to more closely reflect the full risks associated with wildfire liabilities. This would undoubtedly have the effect of further reducing share prices for companies with electric utility operations in California.

**Q. What is your conclusion regarding the implied risk from recent stock price performance?**

A. Much like the industry risk approach, it is not possible to determine a suitable proxy for the incremental risks associated with wildfires as there are a limited number of comparable companies. However, by reviewing the change in stock prices for Edison International and PG&E Corp. we gain insights that are indicative of investors increasing their return requirements for California Utilities, and the risks associated with catastrophic wildfires. Edison International represents a proxy for partially mitigated risk through the market's assumption that state-sponsored relief is likely to be granted soon, and PG&E Corp. represents a company that is facing unmitigated risks and has filed for Chapter 11 reorganization. These results suggest that the current state of regulatory and legal practices, when applied to SDG&E's CPUC jurisdictional operations, would require a wildfire risk premium that is far above the average utility's cost of equity.

**C. The Estimated Loss Approach**

**Q. Please describe your approach to estimating the risk of potential losses associated with wildfires.**

A. As described above, the Company experienced a devastating wildfire in 2007 resulting in significant liabilities that were borne by shareholders.

Since that time, the Company has made substantial efforts to mitigate that risk as described in its WMP. Nonetheless, even though the Company has sought to limit the potential for another catastrophic wildfire, it cannot eliminate that risk. The Company has also taken steps to limit its financial exposure to the potential liabilities associated with wildfire events. But it may also be financially inefficient to fully-insure against that risk, if it is even possible. Looking at the earnings impact from future wildfire liabilities relative to the Company's insurance coverage, however, can reveal the amount of losses an investor can expect, and the offsetting earnings required to compensate for that loss.

**Q. What is the Company's current level of insurance coverage for liabilities associated with wildfires?**

A. The Company currently maintains insurance policies for wildfire liabilities with a covered amount of $1.5 billion. This includes several conventional insurance policies arrayed in an "insurance tower," which also includes a CAT bond. For comparison, the liability claims and expenses associated with the 2007 wildfires were approximately $2.4 billion. If the Company experienced an event of a similar magnitude today, there would be a potential gap of $900 million of claims above insurance reimbursements. However, the effects of inflation, increased residential and commercial density in the service territory, and litigation experience could make a similar fire far more costly today.

**Q. What is the estimated likelihood of a catastrophic wildfire with significant liabilities to the Company?**

While the Company makes substantial efforts to mitigate the likelihood of an ignition and has made investments to limit the consequences of an ignition event, the risk cannot be eliminated completely. The Company is developing a risk assessment for its wildfire risk in preparation for its upcoming Risk Assessment Mitigation Phase ("RAMP") filing, to be submitted by November 30, 2019. This risk assessment models the likelihood and consequence of SDG&E's wildfire risk at a point in time using a probability distribution of possible scenarios. This risk modeling incorporates wildfire-related items, including:

1. wildfire behavior (*i.e.* the utilization of vegetation, topography, and weather patterns to estimate fire growth);
2. housing prices;
3. climate change; and
4. risk-reducing effects of SDG&E's existing wildfire mitigation activities.

SDG&E's wildfire risk model results in a 1-in-20-year event, or a 5 percent annual probability of a potential $1.7 billion financial loss. That said, there is a potential for wildfire liabilities to exceed this threshold. To estimate the point in which any incremental wildfire liability will exceed the Company's present insurance coverage of $1.5 billion, SDG&E's wildfire risk model results in a 5.33 percent probability in any given year of a $1.5 billion or greater financial loss. The average of the scenarios where potential wildfire liabilities exceeds the present insurance coverage results in an approximate average loss of $3.68 billion for these scenarios.

**Q. What are the losses an investor can expect given this probability of wildfire liabilities?**

A. Assuming a liability of $3.68 billion, $1.5 billion would be reimbursed through insurance policies. Under present FERC practices, discussed earlier, 18.4 percent of the remaining $2.18 billion of liabilities ($401 million) would likely be recoverable under FERC rates.[26] The remaining potential liability to the Company would be $1.78 billion, subject to CPUC recovery. There would also be a reduction in income tax liability that would have the effect of reducing the loss borne by shareholders by 27.6 percent.[27] This results in an after-tax exposure of $1.29 billion that would be subject to a cost recovery proceeding at the CPUC. Given the precedent of SDG&E's WEMA decision, the assumption is that the $1.29 billion would be borne by shareholders. Applying this loss to an annual probability of 5.33 percent (*i.e.*, approximately a 1-in-20-years probability) suggests an estimated loss value of $68.62 million.

**Q. How can shareholders be compensated for bearing this incremental risk above the average utility risk profile?**

A. SDG&E's projected total CPUC-jurisdictional gas and electric 2019 rate base is $6.54 billion,[28] and the Company's requested equity ratio in this Application is 56 percent common equity, resulting in an equity component

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[26] This assumption reflects the disposition of SDG&E's regulatory claims for the 2007 wildfire liabilities; we recognize that both the CPUC and FERC recoveries could be different for future fires.

[27] This assumes that the tax shield created by the wildfire losses could be fully utilized on a timely basis; this assumption causes our estimated risk premium to be conservative.

[28] A.17-10-007/-008 (cons.), Update Testimony of Southern California Gas Company and San Diego Gas & Electric Company (August 2018) at Attachment B, B-1.

of rate base of $3.66 billion. Providing investors a premium for compensation of potential annual wildfire liabilities of approximately $69 million would require 1.87 percent (187 basis points) to be added to SDG&E's ROE recommendation.

We recognize that the CPUC may grant partial or even full recovery of these future costs through inclusion of these costs in rates. However, based on past decisions, investors would not be willing to make such an assumption today. Therefore, this risk should be compensated through a higher allowed return, if the legal and regulatory framework for cost recovery remains unchanged.

## D. The Insurance Approach

**Q. Please describe the Company's insurance coverage, and the costs associated with limiting financial exposure to wildfire liabilities.**

A. As previously described, the Company's current insurance policies cover wildfire related liabilities up to $1.5 billion. This includes the insurance tower comprised of several policies, as well as a CAT bond. The total annual premiums for this level of coverage is $[redacted] million, which equates to an average Rate On Line ("ROL") of [redacted] percent. Approximately half of these policies are based on multi-year agreements with fixed premiums that were established in 2017. Given that the average ROL in 2017 was [redacted] percent, this implies that the agreements that were established in 2018 have premiums equating to an ROL of [redacted] percent. While the Company has not yet completed negotiations for 2019 insurance policies, initial

quotes suggest that insurance premiums have increased. In 2020, many of the long-term agreements will expire, so the lower-cost premiums established in 2017 will have to be renegotiated based on the market price in 2020.

**Q. If there were a catastrophic wildfire with substantial liabilities, how does the Company's insurance coverage mitigate its exposure to losses?**

A. The Company's current insurance policies include coverage of up to $1.5 billion (including its CAT bond). Shareholders are assumed to bear the burden of any liabilities deemed not eligible for cost recovery from ratepayers. One potential strategy to offset this risk would be to increase the Company's insurance coverage associated with wildfire liabilities. If the CPUC were to approve cost recovery of these higher insurance costs the impacts on shareholders would be lessened. However, the market is limited, and this may not be possible.

**Q. What would it cost for the Company to acquire insurance to increase its wildfire liability coverage?**

A. This cost is difficult to estimate because there are typically several policies that comprise the overall insurance tower, and insurance may not be available above a certain level of liability. Under normal market conditions, there is an expectation that the average ROL would decrease for incremental levels of coverage because higher levels of coverage are typically associated with lower probabilities of losses. However, increasing premiums in the current market for wildfire liability insurance in California makes it difficult to discern what the cost would be for coverage above the Company's current

$1.5 billion limit, and whether any descending ROL would apply to subsequent tiers. In addition, the Company's risk assessments indicate that if a major fire was to occur, the likelihood is that the liability would far exceed the current insurance level. In other words, because the expected liability for a fire with consequences above $1.5 billion is far above $1.5 billion (as discussed above, an annual five percent chance of a $1.7 billion event, with an average expected liability of $3.68 billion for modeled wildfire events that would exceed the Company's insurance coverage), the premia for additional tranches of insurance may not reflect discounts relative to the aggregate premiums for the base $1.5 billion of coverage.

However, to get a sense of a range of premiums, one could assume that the Company could receive the average ROL for agreements that were established in 2018 to cover the entirety of the $2.2 billion of incremental risk between $1.5 billion and the risk model's expected liability of $3.68 billion (based on the average expected liability for fires that exceed the current insurance level).[29] In the event a $3.68 billion liability event is incurred, and shareholders are self-insuring for this incremental liability above $1.5 billion (*i.e.*, for $2.2 billion of incremental liability coverage),

[29] The $3.68 billion value assumed for the maximum insured event yields coverage for about 98% of the annual wildfire liability amounts modeled by SDG&E. While the Company's risk models suggest the upper end of the distribution could far exceed this $3.68 billion scenario, given that the insurance market is limited, it is unlikely that it would be cost effective to insure above this level, and may not be possible.

the effect of income taxes would reduce the incremental loss borne by shareholders by 27.6 percent to $1.58 billion.[30]

Based on an equity rate base of $3.66 billion, the cost of incremental insurance coverage of $1.58 billion of liabilities at the 2018 ROL would be equivalent to providing equity investors a 3.68 percent risk premium to accept this risk. Using these estimates of the costs observed in the insurance market, that is the implied cost of shareholders being responsible to "self-insure" the additional $2.2 billion in risk above the Company's $1.5 billion in insurance to fully cover the average expected wildfire loss of $3.68 billion for wildfire events above $1.5 billion.

**Q. Is this assumed ROL reasonable compared to the Company's current premiums?**

A. It is almost certainly too low. While it is reasonable to expect that the ROL for liabilities above the Company's first $1.5 billion of liability coverage would be somewhat lower on a relative basis, recent trends have suggested insurance premiums for policies that would cover wildfire liabilities are increasing. An ROL at the Company's 2018 renewal rate is therefore a very conservative (low) estimate of the cost to insure an additional $2.18 billion ($1.58 billion after tax) in liability. Additionally, the estimated 3.68 percent risk premium does not account for the risk shareholders bear for liabilities

[30] Compared to the Company having to pay $2.2 billion to a third-party for the same amount of insurance because the Company could not deduct any losses suffered by the insurer.

that exceed $3.68 billion and is, therefore, an incomplete estimate of the total liability risk borne by shareholders.

Given that the insurance industry provides a clear price signal for the cost required to bear the risk of wildfire liabilities, insurance premiums provide a suitable proxy for the incremental risk premium investors require to invest in the Company, given the current risk arising from wildfire liabilities, as compared to average risk utilities.

## E. The CAT Bond Approach

**Q. Are there other indicative prices in the Company's insurance coverage?**

A. Yes. As discussed above, the Company's total wildfire liability coverage includes a CAT bond that provides reimbursement for $135 million of liabilities in the event that a catastrophic wildfire causes liabilities of a defined amount. The CAT bond was issued with a coupon rate of LIBOR plus 400 basis points. The bond was issued at par on October 12, 2018, when LIBOR was at 2.44 percent, indicating a yield at issuance of 6.44 percent. The CAT bond carries a three-year term, over which investors are paid interest quarterly. At the end of the term, investors are returned their principal, from an independent trustee, if the defined catastrophic event has not occurred. If the triggering event does occur, which is a fire with damages above the $1.37 billion insurance policy, investors' principal repayment is reduced or eliminated, and the Company is paid the principal value of the bond. Given the debt structure of this insurance product, a

comparison of pricing for this CAT bond relative to a measure of the risk-free rate provides an indication of the risk premium associated with wildfire liabilities.

**Q. How can SDG&E's CAT bond yields be used to determine a wildfire risk premium?**

A. The CAT bonds were issued by a third-party entity, SD Re Ltd., which is a special purpose insurer that retains the associated principal in a trust and is managed by a third-party. As such, investors in the CAT bond are not exposed to the same default risks as an investor in SDG&E's conventional bonds. The primary risk to CAT bond investors is the risk of a wildfire causing liabilities to the Company exceeding the prescribed attachment level during the 3-year holding period. Therefore, to assess the investors' required return for this risk, the appropriate comparison is the CAT bond yield relative to the 3-year U.S. Treasury note as a measure of the risk-free rate. On the date of the CAT bond issuance, the yield on the 3-year U.S. Treasury note was 2.93 percent. This indicates a premium of 3.51 percent for the CAT bond and its associated wildfire liability risk. Since we are estimating the implicit cost for shareholders to self-insure, the assumed premium is reduced by the composite tax rate of 27.6 percent for a tax-adjusted estimate of 2.54 percent.

**Q. How has this premium on the CAT bond changed since the issuance date?**

A. As stated earlier, SDG&E's CAT bond was issued before the disastrous 2018 wildfires occurred. There have been a limited number of transactions

for SDG&E's CAT bond, so pricing information is only available for a few observations. However, for each transaction, the required yield and premium over conventional debt has increased since the CAT bond was issued. Table 2 provides the 3-year Treasury rate, the yield for SDG&E's CAT bond for each secondary sale, and the pre-tax and after-tax spreads above the risk-free rate. These transactions suggest investors have required a premium of 4.82 percent to 5.37 percent relative to conventional debt to bear the risk associated with SDG&E's potential wildfire liabilities over a three-year period.

**Table 2: SDG&E CAT Bond Secondary Transactions**

| Date | U.S. Treasury (3-year) | Yield Associated with CAT Bond Transaction | Spread on CAT Bond Relative to U.S. Treasury | Implied ROE Premium (Tax-adjusted) |
|---|---|---|---|---|
| 12/10/2018 | 2.73% | 7.55% | 4.82% | 3.49% |
| 12/19/2018 | 2.61% | 7.60% | 4.99% | 3.61% |
| 3/5/2019 | 2.52% | 7.42% | 4.90% | 3.55% |
| 4/2/2019 | 2.26% | 7.63% | 5.37% | 3.89% |
| 4/3/2019 | 2.29% | 7.61% | 5.32% | 3.85% |

The average observed market spreads and implied risk premiums represent a highly relevant market pricing point for absorbing a very small amount ($135 million) of incremental coverage above SDG&E's conventional insurance policy limits. The most recent observations provide the most reliable indicator of the current return required by investors and suggest an average tax-adjusted risk premium of 3.87 percent.

**Q. What are your conclusions regarding the appropriate risk premium based on the prices associated with SDG&E's wildfire liability risk in the insurance market and in the CAT bond market?**

A. The pricing for incremental coverage above the Company's $1.5 billion is difficult to estimate based on limited availability of such insurance products. However, a reasonable estimate using the Company's 2018 insurance premiums, applied to the incremental $2.2 billion of insurance coverage that investors are currently "self-insuring" (to equal the $3.68 billion in insurance needed to cover the SDG&E model's expected average loss for wildfire events above the Company's $1.5 billion in insurance), has been provided above. Applying this estimate, which is likely very conservative relative to current insurance pricing information, suggests a risk premium of 3.68 percent, or higher with recent quotes, for shareholders to take on this risk. Based on recently observed pricing of CAT bonds, a risk premium of 3.87 percent is estimated for coverage above the insurance tower sufficient to compensate investors for the incremental wildfire risk.

## F. Required Earnings to Restore Credit Metrics

**Q. Please describe how Mr. Shipman has examined the role of credit ratings for California's utilities.**

A. Mr. Shipman, drawing on his 20+ years of utility credit ratings experience with S&P Global Ratings ("S&P"), examines the path of downgrades for California's major utilities, including SDG&E.

**Q. What are Mr. Shipman's principal observations?**

A. Mr. Shipman points to the fact that both Moody's and S&P downgraded both SDG&E and SCE by two notches, out of the A category, in the wake

of the 2017-2018 wildfires and PG&E's bankruptcy filing. These downgrades occurred even though SDG&E was not facing SCE's multi-billion-dollar liabilities from the 2017-2018 wildfires. Mr. Shipman notes that S&P and Moody's currently have SDG&E on a negative outlook.

**Q. What are the implications of Mr. Shipman's assessment on the cost of equity for SDG&E?**

A. He concludes that, unless the business risk of California's wildfires is fully mitigated though legislative and regulatory action, a significant improvement in the financial profile of the utility would be required to help improve investment grade credit ratings. Focusing solely on the cost of equity, he estimates this could be accomplished with a 300 to 400 basis point increase in the allowed ROE for SDG&E. Fully restoring ratings to the pre-wildfire "A" rating would require even further improvement. But he notes that additional measures would be required to obtain the mid-"A" category and that such measures would require sustained effort over a long-time frame and include more tools than only higher equity returns, including "stronger balance sheets and ratesetting protocols that enhance profitability, cash flow, and cash-flow stability."[31]

[31] Ex. SDG&E-05, Ch. 2 (Shipman) at 24-25.

## VI. MITIGATION OF FINANCIAL EXPOSURE TO WILDFIRE LIABILITY RISKS

**Q. Please describe how the Company's financial exposure to wildfire liabilities can be mitigated.**

A. The California Utilities are primarily, but not exclusively, distinguished from the average utility industry risk profile nationwide due to the incremental risks associated with catastrophic wildfires and the potential that wildfire liabilities may be unrecoverable. Mitigating the risk of catastrophic wildfire ignitions is one way to reduce the risk the Company faces. Alternatively, legal reform could alter the current status quo in which wildfire liabilities are potentially unrecoverable.

**Q. What remedies would reduce the risk premium associated with catastrophic wildfire liabilities?**

A. As discussed in a recent Moody's report, safe harbor provisions that ensure reasonable certainty of cost recovery of wildfire liabilities would provide the greatest level of assurance regarding the risks associated with regulatory standards.[32] SDG&E has stated that it should be permitted to recover wildfire liability costs as long as the utility has substantially complied with its approved wildfire mitigation plan. This issue is outstanding before the CPUC.[33] We find that there is value in minimizing both the uncertainty and lag associated with recovery of wildfire liabilities, which could meaningfully reduce the risk to shareholders associated with wildfire

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[32] Moody's Investors Service, Electric Utilities – US, Potential remedies to reduce California fire risk face competing interests (April 3, 2019) at 1 and 3-4.

[33] *See* Rulemaking ("R.") 19-01-006.

liabilities. However, given the CPUC's decision to deny the Company recovery of costs associated with 2007 fires, reasonable precedent would need to be established to ensure that such a plan would meaningfully reduce investors' required returns. Reform to inverse condemnation could be another approach to reducing the risk premium.

**Q. Would legislation eliminating the inverse condemnation doctrine applied to California utilities eliminate the risk premium associated with wildfire liabilities?**

A. While it would substantially reduce the risk premium, it would not eliminate the risk entirely. Assuming that the wildfire liabilities were de-risked such that utilities acting without negligence were not financially harmed, investors still indicate a risk premium would be required for California Utilities. As demonstrated in Exhibit SDG&E-Concentric-3, page 7 to this testimony, a majority of investors ascribed a 10 percent to 20 percent discount to California Utilities assuming wildfire liabilities are de-risked. A 10 percent to 20 percent discount corresponds to an estimated 40 to 90 basis point equity risk premium for the Company. This represents the remaining risk premium for California Utilities assuming that a comprehensive legislative and regulatory remedy that effectively eliminates the legal doctrine of inverse condemnation is implemented. Given the historical application of inverse condemnation by California courts and the CPUC, there remains a degree of uncertainty among investors regarding any remedy until there is demonstrable evidence that the application of such remedy is aligned with average utility risk profile. This will likely require

effective implementation and an established precedent before the risk is fully mitigated.

**Q. What is your conclusion regarding the potential mitigation strategies to limit the financial exposure to wildfire liability risks?**

A. The specific mitigation strategy employed can affect the risk profile of the Company to varying degrees, and therefore the effect on the overall risk premium varies based on the strategy employed. To the extent a legal or regulatory remedy is implemented, further analysis would be required to determine if investors meaningfully reduce required returns in response to the remedy, and, if so, to what level investors reduced their required returns. Given evidence that investors would require a risk premium for California Utilities assuming wildfire liabilities were de-risked, it is unlikely that any remedy would eliminate the risk premium entirely, at least in the near-term. Therefore, the incremental risks due to catastrophic wildfires will continue to distinguish California Utilities from the average utility risk profile. Any remedies that mitigate that risk must be analyzed to determine the degree to which they reduce investors' return requirements.

## VII. SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

**Q. Please summarize the results of your wildfire risk premium analyses.**

A. As discussed above, we have developed six alternative approaches to examine the equity risk adjustment required to compensate SDG&E for the unique risks it faces. These estimates assume California's current legislative and regulatory mechanisms remain in force (*i.e.,* status quo), and

are informed by the available indicators of the incremental costs of bearing these risks.

Our analysis of industry risk produced results which indicate that industries that carry substantial risk of loss, which clearly has been the case for California's electric utilities, carry a risk premium above utility industry norms of as much as 650 basis points, although those industries compensate investors for symmetrical risk. If California Utilities are viewed as being as risky as the overall stock market, but with entirely one-sided risk from wildfires, a risk premium of as much as 550 basis points above industry norms would be defensible. This analysis is only offered as one to establish a range of risk premia rather than a specific value.

Our analysis of implied risk premia from the recent stock price declines of California Utilities contributed very little to our analysis or recommendations, due to significant data limitations. That analysis confirmed, however, that investors' new understanding of wildfire risk has caused the required return to increase for California Utilities, even with the expectation that some form of governmental remedy is likely to be achieved.

Of the six analyses we performed, we place most weight on the Estimated Loss Approach, the Insurance Approach, and the CAT Bond Approach, which offer the most specifically identifiable and quantifiable risk premium values. The Credit Rating analysis provides a reinforcement for these results, but as pointed out by Mr. Shipman, a higher authorized

ROE is only one of several improvements likely required to achieve pre-wildfire credit ratings. Additionally, restoration of a debt credit rating does not necessarily satisfy the risk exposure of equity shareholders.

Taken together, we believe these analyses provide the Commission with an appropriate range of the required risk premium under these extraordinary circumstances.

**Q. Please explain why you have greatest confidence in the Estimated Loss, Insurance and CAT Bond Approaches.**

A. The Estimated Loss Approach is based on the best available estimate of the Company's expected risk of wildfire financial loss, and the earnings required to offset this loss. This analysis, which indicated that a risk premium of 187 basis points was appropriate, directly measures the potential likelihood of an annual unrecoverable wildfire loss above the Company's insurance coverage (approximately a 5 percent annual probability of an average $3.68 billion event), for which the risk premium would compensate investors. There is clearly uncertainty involved in estimating both the probability and magnitude of these losses, but the Company has employed a modeling approach based on its experience and its ongoing efforts to mitigate the risk of ignition and limit the impact of an event. We believe an investor, with the available data, would employ a similar logic to estimate the expected cost requiring compensation.

The Insurance and CAT Bond Approaches are the most specific and direct market measure we have of the cost to "put" the risk to a third party.

We have incorporated the actual costs to insure, or place a catastrophe bond instrument to cover some, or all, of the expected financial risk. The counterparties are informed and sophisticated investors, able to discern the level of risk associated with the wildfires. We then use these costs to estimate the current costs to investors to self-insure (*i.e.*, be responsible for), the SDG&E model's average expected loss of wildfire events that are above the Company's $1.5 billion in coverage – *i.e.* the additional $2.2 billion in self-insurance being provided by investors to cover the annual 5 percent chance of a wildfire event that would cost, on average, $3.68 billion. This approach produces risk premia ranging from 368 basis points up to 387 basis points. However, we consider these to be conservative estimates of the risk premium investors require, reflecting the fact that quotes for insurance coverage are continuing to rise, and that there is very limited, or perhaps no, availability of this coverage in amounts that would be large enough to cover SDG&E's entire wildfire risk.

**Q. What is your recommended ROE adjustment to the Commission?**

A. We combine the Expected Loss, Insurance, and CAT Bond Approaches together to produce a range of results. Based on our analysis, we recommend a ROE adjustment of 3.4 percent. This represents the midpoint between the mean and median of the three methods that allow the most specific quantification of the equity risk, as shown in Table 3: Range of ROE Adjustment Results. We find it appropriate to place greater weight on the market data from insurance costs and the CAT bond yields. And, given

the indications of increasing costs from the insurance market, even the upper end of the range, 3.87 percent, is a conservative measure of the risk premium. Should meaningful legislative or regulatory action be taken to reduce the exposure of shareholders to wildfire risk, this premium could be reduced accordingly.

**Table 3: Range of ROE Adjustment Results**

| Approach to Measuring Wildfire Liability Risk | ROE Adjustment |
|---|---|
| Estimated Loss Approach | 1.87% |
| Insurance Approach | 3.68% |
| CAT Bond Approach | 3.87% |
| Mean | 3.14% |
| Median | 3.68% |
| Midpoint of Mean and Median | 3.41% |

**Q. Does this conclude your Direct Testimony?**

A. Yes, this concludes my prepared direct testimony.

## VIII. STATEMENT OF QUALIFICATIONS

See Exhibits SDG&E-05, Chapter 1 Concentric-1-2 for a full statement of qualifications.

# Exhibit SDG&E-Concentric-1

# Résumés of John J. Reed and James M. Coyne

**John J. Reed**

**Chairman and Chief Executive Officer**

John J. Reed is a financial and economic consultant with more than 42 years of experience in the energy industry. Mr. Reed has also been the CEO of an NASD member securities firm, and Co-CEO of the nation's largest publicly traded management consulting firm (NYSE: NCI). He has provided advisory services in the areas of mergers and acquisitions, asset divestitures and purchases, strategic planning, project finance, corporate valuation, energy market analysis, rate and regulatory matters and energy contract negotiations to clients across North and Central America. Mr. Reed's comprehensive experience includes the development and implementation of nuclear, fossil, and hydroelectric generation divestiture programs with an aggregate valuation in excess of $20 billion. Mr. Reed has also provided expert testimony on financial and economic matters on more than 400 occasions before the FERC, Canadian regulatory agencies, state utility regulatory agencies, various state and federal courts, and before arbitration panels in the United States and Canada. After graduation from the Wharton School of the University of Pennsylvania, Mr. Reed joined Southern California Gas Company, where he worked in the regulatory and financial groups, leaving the firm as Chief Economist in 1981. He served as executive and consultant with Stone & Webster Management Consulting and R.J. Rudden Associates prior to forming REED Consulting Group (RCG) in 1988. RCG was acquired by Navigant Consulting in 1997, where Mr. Reed served as an executive until leaving Navigant to join Concentric as Chairman and Chief Executive Officer.

## REPRESENTATIVE PROJECT EXPERIENCE

### EXECUTIVE MANAGEMENT

As an executive-level consultant, worked with CEOs, CFOs, other senior officers, and Boards of Directors of many of North America's top electric and gas utilities, as well as with senior political leaders of the U.S. and Canada on numerous engagements over the past 25 years. Directed merger, acquisition, divestiture, and project development engagements for utilities, pipelines and electric generation companies, repositioned several electric and gas utilities as pure distributors through a series of regulatory, financial, and legislative initiatives, and helped to develop and execute several "roll-up" or market aggregation strategies for companies seeking to achieve substantial scale in energy distribution, generation, transmission, and marketing.

### FINANCIAL AND ECONOMIC ADVISORY SERVICES

Retained by many of the nation's leading energy companies and financial institutions for services relating to the purchase, sale or development of new enterprises. These projects included major new gas pipeline projects, gas storage projects, several non-utility generation projects, the purchase and sale of project development and gas marketing firms, and utility acquisitions. Specific services provided include the development of corporate expansion plans, review of acquisition candidates, establishment of divestiture standards, due diligence on acquisitions or financing, market entry or expansion studies, competitive assessments, project financing studies, and negotiations relating to these transactions.

### LITIGATION SUPPORT AND EXPERT TESTIMONY

Provided expert testimony on more than 400 occasions in administrative and civil proceedings on a wide range of energy and economic issues. Clients in these matters have included gas distribution

utilities, gas pipelines, gas producers, oil producers, electric utilities, large energy consumers, governmental and regulatory agencies, trade associations, independent energy project developers, engineering firms, and gas and power marketers. Testimony has focused on issues ranging from broad regulatory and economic policy to virtually all elements of the utility ratemaking process. Also frequently testified regarding energy contract interpretation, accepted energy industry practices, horizontal and vertical market power, quantification of damages, and management prudence. Has been active in regulatory contract and litigation matters on virtually all interstate pipeline systems serving the U.S. Northeast, Mid-Atlantic, Midwest, and Pacific regions.

Also served on FERC Commissioner Terzic's Task Force on Competition, which conducted an industry-wide investigation into the levels of and means of encouraging competition in U.S. natural gas markets and served on a "Blue Ribbon" panel established by the Province of New Brunswick regarding the future of natural gas distribution service in that province.

**RESOURCE PROCUREMENT, CONTRACTING AND ANALYSIS**

On behalf of gas distributors, gas pipelines, gas producers, electric utilities, and independent energy project developers, personally managed or participated in the negotiation, drafting, and regulatory support of hundreds of energy contracts, including the largest gas contracts in North America, electric contracts representing billions of dollars, pipeline and storage contracts, and facility leases.

These efforts have resulted in bringing large new energy projects to market across North America, the creation of hundreds of millions of dollars in savings through contract renegotiation, and the regulatory approval of a number of highly contested energy contracts.

**STRATEGIC PLANNING AND UTILITY RESTRUCTURING**

Acted as a leading participant in the restructuring of the natural gas and electric utility industries over the past fifteen years, as an adviser to local distribution companies, pipelines, electric utilities, and independent energy project developers. In the recent past, provided services to most of the top 50 utilities and energy marketers across North America. Managed projects that frequently included the redevelopment of strategic plans, corporate reorganizations, the development of multi-year regulatory and legislative agendas, merger, acquisition and divestiture strategies, and the development of market entry strategies. Developed and supported merchant function exit strategies, marketing affiliate strategies, and detailed plans for the functional business units of many of North America's leading utilities.

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**PROFESSIONAL HISTORY**

**Concentric Energy Advisors, Inc. (2002 – Present)**
Chairman and Chief Executive Officer

**CE Capital Advisors (2004 – Present)**
Chairman, President, and Chief Executive Officer

**Navigant Consulting, Inc. (1997 – 2002)**
President, Navigant Energy Capital (2000 – 2002)
Executive Director (2000 – 2002)
Co-Chief Executive Officer, Vice Chairman (1999 – 2000)
Executive Managing Director (1998 – 1999)
President, REED Consulting Group, Inc. (1997 – 1998)

**REED Consulting Group (1988 – 1997)**
Chairman, President and Chief Executive Officer

**R.J. Rudden Associates, Inc. (1983 – 1988)**
Vice President

**Stone & Webster Management Consultants, Inc. (1981 – 1983)**
Senior Consultant
Consultant

**Southern California Gas Company (1976 – 1981)**
Corporate Economist
Financial Analyst
Treasury Analyst

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**EDUCATION AND CERTIFICATION**

B.S., Economics and Finance, Wharton School, University of Pennsylvania, 1976
Licensed Securities Professional: NASD Series 7, 63, 24, 79 and 99 Licenses

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**BOARDS OF DIRECTORS (PAST AND PRESENT)**

Concentric Energy Advisors, Inc.
Navigant Consulting, Inc.
Navigant Energy Capital
Nukem, Inc.
New England Gas Association
R. J. Rudden Associates
REED Consulting Group

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**AFFILIATIONS**

American Gas Association
Energy Bar Association
Guild of Gas Managers
International Association of Energy Economists
Northeast Gas Association
Society of Gas Lighters
Society of Utility and Regulatory Financial Analysts

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**ARTICLES AND PUBLICATIONS**

"Maximizing U.S. federal loan guarantees for new nuclear energy," *Bulletin of the Atomic Scientists* (with John C. Slocum), July 29, 2009

"Smart Decoupling – Dealing with unfunded mandates in performance-based ratemaking," *Public Utilities Fortnightly*, May 2012

**James M. Coyne**

**Senior Vice President**

Mr. Coyne provides financial, regulatory, strategic, and litigation support services to clients in the natural gas, power, and utilities industries. Drawing upon his industry and regulatory expertise, he regularly advises utilities, public agencies and investors on business strategies, investment evaluations, and matters pertaining to rate and regulatory policy. Prior to Concentric, Mr. Coyne worked in senior consulting positions focused on North American utilities industries, in corporate planning for an integrated energy company, and in regulatory and policy positions in Maine and Massachusetts. He has authored numerous articles on the energy industry and provided testimony and expert reports before the Federal Energy Regulatory Commission and numerous jurisdictions in the U.S. and Canada. Mr. Coyne holds a B.S. in Business from Georgetown University with honors and an M.S. in Resource Economics from the University of New Hampshire.

**AREAS OF EXPERTISE**

- **Energy Regulation**
  - Rate policy
  - Cost of capital
  - Incentive regulation
  - Fuels and power markets
- **Management and Business Strategy**
  - Fuels and power market assessments
  - Investment feasibility
  - Corporate and business unit planning
  - Benchmarking and productivity analysis
- **Financial and Economic Advisory**
  - Valuation analysis
  - Due diligence
  - Buy and sell-side advisory
- **Litigation Support and Expert Testimony**
  - Rate and regulatory policy
  - Fuels and power markets
  - Contract litigation
  - Valuation and damages

**PUBLICATIONS AND RESEARCH**

- "Regulator Rationale for Ratepayer-Funded Electricity and Natural Gas Innovation", James M. Coyne, Robert C. Yardley, Jr. and Jessalyn G. Pryciak, Energy Regulation Quarterly, Volume 6, Issue 3, 2018.
- "Stimulating Innovation on Behalf of Canada's Electricity and Natural Gas Consumers" (with Robert Yardley), prepared for the Canadian Gas Association and Canadian Electricity Association, May, 2015.
- "Autopilot Error: Why Similar U.S. and Canadian Risk Profiles Yield Varied Rate-making Results" (with John Trogonoski), Public Utilities Fortnightly, May 2010
- "A Comparative Analysis of Return on Equity of Natural Gas Utilities" (with Dan Dane and Julie Lieberman), prepared for the Ontario Energy Board, June, 2007
- "Do Utilities Mergers Deliver?" (with Prescott Hartshorne), Public Utilities Fortnightly, June 2006
- "Winners and Losers: Utility Strategy and Shareholder Return" (with Prescott Hartshorne), Public Utilities Fortnightly, October 2004
- "Winners and Losers in Restructuring: Assessing Electric and Gas Company Financial Performance" (with Prescott Hartshorne), white paper distributed to clients and press, August 2003
- "The New Generation Business," commissioned by the Electric Power Research Institute (EPRI) and distributed to EPRI members to contribute to a series on the changes in the Power Industry, December 2001
- Potential for Natural Gas in the United States, Volume V, Regulatory and Policy Issues (co-author), National Petroleum Council, December 1992
- "Natural Gas Outlook," articles on U.S. natural gas markets, published quarterly in the Data Resources Energy Review and Natural Gas Review, 1984-1989

**SELECTED SPEAKING ENGAGEMENTS**

- "Energy Sector in Transition", Ontario Energy Association, Toronto, ON, September 24, 2018.
- "Understanding Regulated Utilities in Today's Capital Markets", NARUC Annual Meeting, La Quinta, CA, November 14, 2016.
- "Rate of Return: Where the Regulatory Rubber Meets the Road," CAMPUT Annual Conference, Montreal, Quebec, May 17, 2016.
- "Innovations in Utility Business Models and Regulation", The Canadian Association of Members of Public Utility Tribunals (CAMPUT) 2015 Energy Regulation Course, Queens University, Kingston, Ontario, June 2015

- "M&A and Valuations," Panelist at Infocast Utility Scale Solar Summit, September 2010
- "The Use of Expert Evidence," The Canadian Association of Members of Public Utility Tribunals (CAMPUT) 2010 Energy Regulation Course, Queens University, Kingston, Ontario, June 2010
- "A Comparative Analysis of Return on Equity for Utilities in Canada and the U.S.", The Canadian Association of Members of Public Utility Tribunals (CAMPUT) Annual Conference, Banff, Alberta, April 22, 2008
- "Nuclear Power on the Verge of a New Era," moderator for a client event co-hosted by Sutherland Asbill & Brennan and Lexecon, Washington D.C., October 2005
- "The Investment Implications of the Repeal of PUCHA," Skadden Arps Client Conference, New York, NY, October 2005
- "Anatomy of the Deal," First Annual Energy Transactions Conference, Newport, RI, May 2005
- "The Outlook for Wind Power," Skadden Arps Annual Energy and Project Finance Seminar, Naples, FL, March 2005
- "Direction of U.S. M&A Activity for Utilities," Energy and Mineral Law Foundation Conference, Sanibel Island, FL, February 2002
- "Outlook for U.S. Merger & Acquisition Activity," Utility Mergers & Acquisitions Conference, San Antonio, TX, October 2001
- "Investor Perspectives on Emerging Energy Companies," Panel Moderator at Energy Venture Conference, Boston, MA, June 2001
- "Electric Generation Asset Transactions: A Practical Guide," workshop conducted at the 1999 Thai Electricity and Gas Investment Briefing, Bangkok, Thailand, July 1999
- "New Strategic Options for the Power Sector," Electric Utility Business Environment Conference, Denver, CO, May 1999
- "Electric and Gas Industries: Moving Forward Together," New England Gas Association Annual Meeting, November 1998
- "Opportunities and Challenges in the Electric Marketplace," Electric Power Research Institute, July 1998

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**PROFESSIONAL HISTORY**

**Concentric Energy Advisors, Inc. (2006 – Present)**
Senior Vice President
Vice President

**FTI Consulting (Lexecon) (2002 – 2006)**
Senior Managing Director – Energy Practice

**Arthur Andersen LLP (2000 – 2002)**

Managing Director, Andersen Corporate Finance – Energy and Utilities

**Navigant Consulting, Inc. (1996 – 2000)**
Managing Director, Financial Services Practice
Senior Vice President, Strategy Practice

**TotalFinaElf (1990 – 1996)**
Manager, Corporate Planning and Development
Manager, Investor Relations
Manager of Strategic Planning and Vice President, Natural Gas Division

**Arthur D. Little, Inc. (1989 – 1990)**
Senior Consultant – International Energy Practice

**DRI/McGraw-Hill (1984 – 1989)**
Director, North American Natural Gas Consulting
Senior Economist, U.S. Electricity Service

**Massachusetts Energy Facilities Siting Council (1982 – 1984)**
Senior Economist – Gas and Electric Utilities

**Maine Office of Energy Resources (1981 – 1982)**
State Energy Economist

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**EDUCATION**

M.S., Resource Economics, University of New Hampshire, with Honors, 1981

B.S., Business Administration and Economics, Georgetown University, Cum Laude, 1975

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**DESIGNATIONS AND AFFILIATIONS**

Community Rowing Inc., Board of Directors, 2015 - current

Georgetown University, Alumni Admissions Interviewer, 1988 – current

NASD General Securities Representative and Managing Principal (Series 7, 63 and 24 Certifications), 2001

American Petroleum Institute, CEO's Liaison to Management and Policy Committees, 1994-1996

National Petroleum Council, Regulatory and Policy Task Forces, 1992

President, International Association for Energy Economics, Dallas Chapter, 1995

Gas Research Institute, Economics Advisory Committee, 1990-1993

NARUC, Advanced Regulatory Studies Program, Michigan State University, 1984

**Exhibit SDG&E-Concentric-2**
**Testimony listings of John J. Reed and James M. Coyne**

| SPONSOR | DATE | CASE/APPLICANT | DOCKET NO. | SUBJECT |
|---|---|---|---|---|
| **Alaska Regulatory Commission** | | | | |
| Chugach Electric | 12/86 | Chugach Electric | Docket No. U-86-11 | Cost Allocation |
| Chugach Electric | 5/87 | Enstar Natural Gas Company | Docket No. U-87-2 | Tariff Design |
| Chugach Electric | 12/87 | Enstar Natural Gas Company | Docket No. U-87-42 | Gas Transportation |
| Chugach Electric | 11/87<br>2/88 | Chugach Electric | Docket No. U-87-35 | Cost of Capital |
| Anchorage Municipal Light & Power | 9/17 | Anchorage Municipal Light & Power | Docket No. U-16-094<br>Docket No. U-17-008 | Project Prudence |
| **Alberta Utilities Commission** | | | | |
| Alberta Utilities (AltaLink, EPCOR, ATCO, ENMAX, FortisAlberta, AltaGas) | 1/13 | Alberta Utilities | Application 1566373, Proceeding ID 20 | Stranded Costs |
| **Arizona Corporation Commission** | | | | |
| Tucson Electric Power | 7/12 | Tucson Electric Power | Docket No. E-01933A-12-0291 | Cost of Capital |
| UNS Energy and Fortis Inc. | 1/14 | UNS Energy, Fortis Inc. | Docket No. E-04230A-00011 and Docket No. E-01933A-14-0011 | Merger |
| **California Energy Commission** | | | | |
| Southern California Gas Co. | 8/80 | Southern California Gas Co. | Docket No. 80-BR-3 | Gas Price Forecasting |
| **California Public Utility Commission** | | | | |
| Southern California Gas Co. | 3/80 | Southern California Gas Co. | TY 1981 G.R.C. | Cost of Service, Inflation |
| Pacific Gas Transmission Co. | 10/91<br>11/91 | Pacific Gas & Electric Co. | App. 89-04-033 | Rate Design |
| Pacific Gas Transmission Co. | 7/92 | Southern California Gas Co. | A. 92-04-031 | Rate Design |
| **Colorado Public Utilities Commission** | | | | |
| AMAX Molybdenum | 2/90 | Commission Rulemaking | Docket No. 89R-702G | Gas Transportation |

| SPONSOR | DATE | CASE/APPLICANT | DOCKET NO. | SUBJECT |
|---|---|---|---|---|
| AMAX Molybdenum | 11/90 | Commission Rulemaking | Docket No. 90R-508G | Gas Transportation |
| Xcel Energy | 8/04 | Xcel Energy | Docket No. 031-134E | Cost of Debt |
| Public Service Company of Colorado | 6/17 | Public Service Company of Colorado | Docket No. 17AL-0363G | Return on Equity (Gas) |
| **CT Dept. of Public Utilities Control** | | | | |
| Connecticut Natural Gas | 12/88 | Connecticut Natural Gas | Docket No. 88-08-15 | Gas Purchasing Practices |
| United Illuminating | 3/99 | United Illuminating | Docket No. 99-03-04 | Nuclear Plant Valuation |
| Southern Connecticut Gas | 2/04 | Southern Connecticut Gas | Docket No. 00-12-08 | Gas Purchasing Practices |
| Southern Connecticut Gas | 4/05 | Southern Connecticut Gas | Docket No. 05-03-17 | LNG/Trunkline |
| Southern Connecticut Gas | 5/06 | Southern Connecticut Gas | Docket No. 05-03-17PH01 | LNG/Trunkline |
| Southern Connecticut Gas | 8/08 | Southern Connecticut Gas | Docket No. 06-05-04 | Peaking Service Agreement |
| **District of Columbia PSC** | | | | |
| Potomac Electric Power Company | 3/99<br>5/99<br>7/99 | Potomac Electric Power Company | Docket No. 945 | Divestiture of Gen. Assets & Purchase Power Contracts |
| AltaGas Ltd./WGL Holdings | 4/17<br>8/17<br>10/17 | AltaGas Ltd./WGL Holdings | Docket No. 1142 | Merger Standards, Public Interest Standard |
| **Federal Energy Regulatory Commission** | | | | |
| Safe Harbor Water Power Corp. | 8/82 | Safe Harbor Water Power Corp. | | Wholesale Electric Rate Increase |
| Western Gas Interstate Company | 5/84 | Western Gas Interstate Company | Docket No. RP84-77 | Load Forecast Working Capital |
| Southern Union Gas | 4/87<br>5/87 | El Paso Natural Gas Company | Docket No. RP87-16-000 | Take-or-Pay Costs |
| Connecticut Natural Gas | 11/87 | Penn-York Energy Corporation | Docket No. RP87-78-000 | Cost Allocation/Rate Design |
| AMAX Magnesium | 12/88<br>1/89 | Questar Pipeline Company | Docket No. RP88-93-000 | Cost Allocation/Rate Design |

| SPONSOR | DATE | CASE/APPLICANT | DOCKET NO. | SUBJECT |
|---|---|---|---|---|
| Western Gas Interstate Company | 6/89 | Western Gas Interstate Company | Docket No. RP89-179-000 | Cost Allocation/Rate Design, Open-Access Transportation |
| Associated CD Customers | 12/89 | CNG Transmission | Docket No. RP88-211-000 | Cost Allocation/Rate Design |
| Utah Industrial Group | 9/90 | Questar Pipeline Company | Docket No. RP88-93-000, Phase II | Cost Allocation/Rate Design |
| Iroquois Gas Trans. System | 8/90 | Iroquois Gas Transmission System | Docket No. CP89-634-000/001; CP89-815-000 | Gas Markets, Rate Design, Cost of Capital, Capital Structure |
| Boston Edison Company | 1/91 | Boston Edison Company | Docket No. ER91-243-000 | Electric Generation Markets |
| Cincinnati Gas and Electric Co., Union Light, Heat and Power Company, Lawrenceburg Gas Company | 7/91 | Texas Gas Transmission Corp. | Docket No. RP90-104-000, RP88-115-000, RP90-192-000 | Cost Allocation, Rate Design, Comparability of Service |
| Ocean State Power II | 7/91 | Ocean State Power II | ER89-563-000 | Competitive Market Analysis, Self-dealing |
| Brooklyn Union/PSE&G | 7/91 | Texas Eastern | RP88-67, et al | Market Power, Comparability of Service |
| Northern Distributor Group | 9/92<br>11/92 | Northern Natural Gas Company | RP92-1-000, et al | Cost of Service |
| Canadian Association of Petroleum Producers and Alberta Pet. Marketing Comm. | 10/92<br>7/97 | Lakehead Pipe Line Co. L.P. | IS92-27-000 | Cost Allocation, Rate Design |
| Colonial Gas, Providence Gas | 7/93<br>8/93 | Algonquin Gas Transmission | RP93-14 | Cost Allocation, Rate Design |
| Iroquois Gas Transmission | 94 | Iroquois Gas Transmission | RP94-72-000 | Cost of Service, Rate Design |
| Transco Customer Group | 1/94 | Transcontinental Gas Pipeline Corporation | Docket No. RP92-137-000 | Rate Design, Firm to Wellhead |
| Pacific Gas Transmission | 2/94<br>3/95 | Pacific Gas Transmission | Docket No. RP94-149-000 | Rolled-In vs. Incremental Rates, Rate Design |

| SPONSOR | DATE | CASE/APPLICANT | DOCKET NO. | SUBJECT |
|---|---|---|---|---|
| Tennessee GSR Group | 1/95<br>3/95<br>1/96 | Tennessee Gas Pipeline Company | Docket Nos. RP93-151-000, RP94-39-000, RP94-197-000, RP94-309-000 | GSR Costs |
| PG&E and SoCal Gas | 8/96<br>9/96 | El Paso Natural Gas Company | RP92-18-000 | Stranded Costs |
| Iroquois Gas Transmission System, L.P. | 97 | Iroquois Gas Transmission System, L.P. | RP97-126-000 | Cost of Service, Rate Design |
| BEC Energy - Commonwealth Energy System | 2/99 | Boston Edison Company/ Commonwealth Energy System | EC99-33-000 | Market Power Analysis – Merger |
| Central Hudson Gas & Electric, Consolidated Co. of New York, Niagara Mohawk Power Corporation, Dynegy Power Inc. | 10/00 | Central Hudson Gas & Electric, Consolidated Co. of New York, Niagara Mohawk Power Corporation, Dynegy Power Inc. | Docket No. EC01-7-000 | Market Power 203/205 Filing |
| Wyckoff Gas Storage | 12/02 | Wyckoff Gas Storage | CP03-33-000 | Need for Storage Project |
| Indicated Shippers/Producers | 10/03 | Northern Natural Gas | Docket No. RP98-39-029 | Ad Valorem Tax Treatment |
| Maritimes & Northeast Pipeline | 6/04 | Maritimes & Northeast Pipeline | Docket No. RP04-360-000 | Rolled-In Rates |
| ISO New England | 8/04<br>2/05 | ISO New England | Docket No. ER03-563-030 | Cost of New Entry |
| Transwestern Pipeline Company, LLC | 9/06 | Transwestern Pipeline Company, LLC | Docket No. RP06-614-000 | Business Risk |
| Portland Natural Gas Transmission System | 6/08 | Portland Natural Gas Transmission System | Docket No. RP08-306-000 | Market Assessment, Natural Gas Transportation, Rate Setting |

| SPONSOR | DATE | CASE/APPLICANT | DOCKET NO. | SUBJECT |
|---|---|---|---|---|
| Portland Natural Gas Transmission System | 5/10<br>3/11<br>4/11 | Portland Natural Gas Transmission System | Docket No. RP10-729-000 | Business Risks, Extraordinary and Non-recurring Events Pertaining to Discretionary Revenues |
| Morris Energy | 7/10 | Morris Energy | Docket No. RP10-79-000 | Impact of Preferential Rate |
| Gulf South Pipeline | 10/14 | Gulf South Pipeline | Docket No. RP15-65-000 | Business Risk, Rate Design |
| BNP Paribas Energy Trading, GP<br>South Jersey Resource Group, LLC | 2/15 | Transcontinental Gas Pipe Line Corporation | Docket No. RP06-569-008 and RP07-376-005 | Regulatory Policy, Incremental Rates, Stacked Rate |
| Tallgrass Interstate Gas Transmission, LLC | 10/15<br>12/15 | Tallgrass Interstate Gas Transmission, LLC | Docket No. RP16-137-000 | Market Assessment, Rate Design, Rolled-in Rate Treatment |
| **Florida Public Service Commission** | | | | |
| Florida Power and Light Co. | 10/07 | Florida Power & Light Co. | Docket No. 070650-EI | Need for New Nuclear Plant |
| Florida Power and Light Co. | 5/08 | Florida Power & Light Co. | Docket No. 080009-EI | New Nuclear Cost Recovery, Prudence |
| Florida Power and Light Co. | 3/09<br>8/09 | Florida Power & Light Co. | Docket No. 080677-EI | Benchmarking in Support of ROE |
| Florida Power and Light Co. | 3/09<br>5/09<br>8/09 | Florida Power & Light Co. | Docket No. 090009-EI | New Nuclear Cost Recovery, Prudence |
| Florida Power and Light Co. | 3/10<br>5/10<br>8/10 | Florida Power & Light Co. | Docket No. 100009-EI | New Nuclear Cost Recovery, Prudence |
| Florida Power and Light Co. | 3/11<br>7/11 | Florida Power & Light Co. | Docket No. 110009-EI | New Nuclear Cost Recovery, Prudence |

| SPONSOR | DATE | CASE/APPLICANT | DOCKET NO. | SUBJECT |
|---|---|---|---|---|
| Florida Power and Light Co. | 3/12<br>7/12 | Florida Power & Light Co. | Docket No. 120009-EI | New Nuclear Cost Recovery, Prudence |
| Florida Power and Light Co. | 3/12<br>8/12 | Florida Power & Light Co. | Docket No. 120015-EI | Benchmarking in Support of ROE |
| Florida Power and Light Co. | 3/13<br>7/13 | Florida Power & Light Co. | Docket No. 130009 | New Nuclear Cost Recovery, Prudence |
| Florida Power and Light Co. | 3/14 | Florida Power & Light Co. | Docket No. 140009 | New Nuclear Cost Recovery, Prudence |
| Florida Power and Light Co. | 3/15<br>7/15 | Florida Power & Light Co. | Docket No. 150009 | New Nuclear Cost Recovery, Prudence |
| Florida Power and Light Co. | 10/15 | Florida Power and Light Co. | Docket No. 150001 | Recovery of Replacement Power Costs |
| Florida Power and Light Co. | 3/16 | Florida Power & Light Co. | Docket No. 160021-EI | Benchmarking in Support of ROE |
| **Florida Senate Committee on Communication, Energy and Utilities** | | | | |
| Florida Power and Light Co. | 2/09 | Florida Power & Light Co. | | Securitization |
| **Hawai'i Public Utility Commission** | | | | |
| Hawaiian Electric Light Company, Inc. | 6/00 | Hawaiian Electric Light Company, Inc. | Docket No. 99-0207 | Standby Charge |
| NextEra Energy, Inc.<br>Hawaiian Electric Companies | 4/15<br>8/15<br>10/15 | Hawaiian Electric Company, Inc.; Hawaii Electric Light Company, Inc., Maui Electric Company, Ltd., NextEra Energy, Inc. | Docket No. 2015-0022 | Merger Application |
| **Idaho Public Utilities Commission** | | | | |
| Hydro One Limited and Avista Corporation | 9/18<br>11/18 | Hydro One Limited and Avista Corporation | Case No. AVU-E-17-09<br>Case No. AVU-G-17-05 | Governance, Financial Integrity and Ring-fencing Merger Commitments |

| SPONSOR | DATE | CASE/APPLICANT | DOCKET NO. | SUBJECT |
|---|---|---|---|---|
| **Illinois Commerce Commission** | | | | |
| Renewables Suppliers (Algonquin Power Co., EDP Renewables North America, Invenergy, NextEra Energy Resources) | 3/14 | Renewables Suppliers | Docket No. 13-0546 | Application for Rehearing and Reconsideration, Long-term Purchase Power Agreements |
| WE Energies Corporation | 8/14<br>12/14<br>2/15 | WE Energies/Integrys | Docket No. 14-0496 | Merger Application |
| **Indiana Utility Regulatory Commission** | | | | |
| Northern Indiana Public Service Company | 10/01 | Northern Indiana Public Service Company | Cause No. 41746 | Valuation of Electric Generating Facilities |
| Northern Indiana Public Service Company | 1/08<br>3/08 | Northern Indiana Public Service Company | Cause No. 43396 | Asset Valuation |
| Northern Indiana Public Service Company | 8/08 | Northern Indiana Public Service Company | Cause No. 43526 | Fair Market Value Assessment |
| Indianapolis Power & Light Company | 12/14 | Indianapolis Power & Light Company | Cause No. 44576 | Asset Valuation |
| Indianapolis Power & Light Company | 12/16 | Indianapolis Power & Light Company | Cause No. 44893 | Rate Recovery for New Plant Additions, Valuation of Electric Generating Facilities |
| **Iowa Utilities Board** | | | | |
| Interstate Power and Light | 7/05 | Interstate Power and Light and FPL Energy Duane Arnold, LLC | Docket No. SPU-05-15 | Sale of Nuclear Plant |
| Interstate Power and Light | 5/07 | City of Everly, Iowa | Docket No. SPU-06-5 | Municipalization |
| Interstate Power and Light | 5/07 | City of Kalona, Iowa | Docket No. SPU-06-6 | Municipalization |
| Interstate Power and Light | 5/07 | City of Wellman, Iowa | Docket No. SPU-06-10 | Municipalization |
| Interstate Power and Light | 5/07 | City of Terril, Iowa | Docket No. SPU-06-8 | Municipalization |
| Interstate Power and Light | 5/07 | City of Rolfe, Iowa | Docket No. SPU-06-7 | Municipalization |

| SPONSOR | DATE | CASE/APPLICANT | DOCKET NO. | SUBJECT |
|---|---|---|---|---|
| **Kansas Corporation Commission** | | | | |
| Great Plains Energy<br>Kansas City Power and Light Company | 1/17 | Great Plains Energy, Kansas City Power & Light Company, and Westar Energy | Docket No. 16-KCPE-593-ACQ | Merger Standards, Acquisition Premium, Ring-Fencing, Public Interest Standard |
| Great Plains Energy<br>Kansas City Power and Light Company | 8/17<br>2/18 | Great Plains Energy, Kansas City Power & Light Company, and Westar Energy | Docket No. 18-KCPE-095-MER | Merger Standards, Transaction Value, Merger Benefits, Ring-Fencing, |
| **Maine Public Utility Commission** | | | | |
| Northern Utilities | 5/96 | Granite State and PNGTS | Docket No. 95-480, 95-481 | Transportation Service and PBR |
| **Maryland Public Service Commission** | | | | |
| Eastalco Aluminum | 3/82 | Potomac Edison | Docket No. 7604 | Cost Allocation |
| Potomac Electric Power Company | 8/99 | Potomac Electric Power Company | Docket No. 8796 | Stranded Cost & Price Protection |
| AltaGas Ltd./WGL Holdings | 4/17<br>9/17<br>1/18<br>2/18 | AltaGas Ltd./WGL Holdings | Docket No. 9449 | Merger Standards, Public Interest Standard |
| **Mass. Department of Public Utilities** | | | | |
| Haverhill Gas | 5/82 | Haverhill Gas | Docket No. DPU #1115 | Cost of Capital |
| New England Energy Group | 1/87 | Commission Investigation | | Gas Transportation Rates |
| Energy Consortium of Mass. | 9/87 | Commonwealth Gas Company | Docket No. DPU-87-122 | Cost Allocation, Rate Design |
| Mass. Institute of Technology | 12/88 | Middleton Municipal Light | DPU #88-91 | Cost Allocation, Rate Design |
| Energy Consortium of Mass. | 3/89 | Boston Gas | DPU #88-67 | Rate Design |
| PG&E Bechtel Generating Co./ Constellation Holdings | 10/91 | Commission Investigation | DPU #91-131 | Valuation of Environmental Externalities |

| SPONSOR | DATE | CASE/APPLICANT | DOCKET NO. | SUBJECT |
|---|---|---|---|---|
| Coalition of Non-Utility Generators | | Cambridge Electric Light Co. & Commonwealth Electric Co. | DPU 91-234<br>EFSC 91-4 | Integrated Resource Management |
| The Berkshire Gas Company<br>Essex County Gas Company<br>Fitchburg Gas and Elec. Light Co. | 5/92 | The Berkshire Gas Company<br>Essex County Gas Company<br>Fitchburg Gas & Elec. Light Co. | DPU #92-154 | Gas Purchase Contract Approval |
| Boston Edison Company | 7/92 | Boston Edison | DPU #92-130 | Least Cost Planning |
| Boston Edison Company | 7/92 | The Williams/Newcorp Generating Co. | DPU #92-146 | RFP Evaluation |
| Boston Edison Company | 7/92 | West Lynn Cogeneration | DPU #92-142 | RFP Evaluation |
| Boston Edison Company | 7/92 | L'Energia Corp. | DPU #92-167 | RFP Evaluation |
| Boston Edison Company | 7/92 | DLS Energy, Inc. | DPU #92-153 | RFP Evaluation |
| Boston Edison Company | 7/92 | CMS Generation Co. | DPU #92-166 | RFP Evaluation |
| Boston Edison Company | 7/92 | Concord Energy | DPU #92-144 | RFP Evaluation |
| The Berkshire Gas Company<br>Colonial Gas Company<br>Essex County Gas Company<br>Fitchburg Gas and Electric Company | 11/93 | The Berkshire Gas Company<br>Colonial Gas Company<br>Essex County Gas Company<br>Fitchburg Gas and Electric Co. | DPU #93-187 | Gas Purchase Contract Approval |
| Bay State Gas Company | 10/93 | Bay State Gas Company | Docket No. 93-129 | Integrated Resource Planning |
| Boston Edison Company | 94 | Boston Edison | DPU #94-49 | Surplus Capacity |
| Hudson Light & Power Department | 4/95 | Hudson Light & Power Dept. | DPU #94-176 | Stranded Costs |
| Essex County Gas Company | 5/96 | Essex County Gas Company | Docket No. 96-70 | Unbundled Rates |
| Boston Edison Company | 8/97 | Boston Edison Company | D.P.U. No. 97-63 | Holding Company Corporate Structure |
| Berkshire Gas Company | 6/98 | Berkshire Gas Mergeco Gas Co. | D.T.E. 98-87 | Merger Approval |
| Eastern Edison Company | 8/98 | Montaup Electric Company | D.T.E. 98-83 | Marketing for Divestiture of its Generation Business |

| SPONSOR | DATE | CASE/APPLICANT | DOCKET NO. | SUBJECT |
|---|---|---|---|---|
| Boston Edison Company | 98 | Boston Edison Company | D.T.E. 97-113 | Fossil Generation Divestiture |
| Boston Edison Company | 2/99 | Boston Edison Company | D.T.E. 98-119 | Nuclear Generation Divestiture |
| Eastern Edison Company | 12/98 | Montaup Electric Company | D.T.E. 99-9 | Sale of Nuclear Plant |
| NStar | 9/07<br>12/07 | NStar, Bay State Gas, Fitchburg G&E, NE Gas, W. MA Electric | DPU 07-50 | Decoupling, Risk |
| NStar | 6/11 | NStar, Northeast Utilities | DPU 10-170 | Merger Approval |
| Town of Milford | 1/19<br>3/19 | Milford Water Company | DPU 18-60 | Valuation Analysis |
| **Mass. Energy Facilities Siting Council** | | | | |
| Mass. Institute of Technology | 1/89 | M.M.W.E.C. | EFSC-88-1 | Least-Cost Planning |
| Boston Edison Company | 9/90 | Boston Edison | EFSC-90-12 | Electric Generation Markets |
| Silver City Energy Ltd. Partnership | 11/91 | Silver City Energy | D.P.U. 91-100 | State Policies, Need for Facility |
| **Michigan Public Service Commission** | | | | |
| Detroit Edison Company | 9/98 | Detroit Edison Company | Case No. U-11726 | Market Value of Generation Assets |
| Consumers Energy Company | 8/06<br>1/07 | Consumers Energy Company | Case No. U-14992 | Sale of Nuclear Plant |
| WE Energies | 12/11 | Wisconsin Electric Power Co | Case No. U-16830 | Economic Benefits, Prudence |
| Consumer Energy Company | 7/13 | Consumers Energy Company | Case No. U-17429 | Certificate of Need, Integrated Resource Plan |
| WE Energies | 8/14<br>3/15 | WE Energies/Integrys | Case No. U-17682 | Merger Application |
| **Minnesota Public Utilities Commission** | | | | |
| Xcel Energy/No. States Power | 9/04 | Xcel Energy/No. States Power | Docket No. G002/GR-04-1511 | NRG Impacts |

| SPONSOR | DATE | CASE/APPLICANT | DOCKET NO. | SUBJECT |
|---|---|---|---|---|
| Interstate Power and Light | 8/05 | Interstate Power and Light and FPL Energy Duane Arnold, LLC | Docket No. E001/PA-05-1272 | Sale of Nuclear Plant |
| Northern States Power Company d/b/a Xcel Energy | 11/05 | Northern States Power Company | Docket No. E002/GR-05-1428 | NRG Impacts on Debt Costs |
| Northern States Power Company d/b/a Xcel Energy | 09/06<br>10/06<br>11/06 | NSP v. Excelsior | Docket No. E6472/M-05-1993 | PPA, Financial Impacts |
| Northern States Power Company d/b/a Xcel Energy | 11/06 | Northern States Power Company | Docket No. G002/GR-06-1429 | Return on Equity |
| Northern States Power | 11/08<br>05/09 | Northern States Power Company | Docket No. E002/GR-08-1065 | Return on Equity |
| Northern States Power | 11/09<br>6/10 | Northern States Power Company | Docket No. G002/GR-09-1153 | Return on Equity |
| Northern States Power | 11/10<br>5/11 | Northern States Power Company | Docket No. E002/GR-10-971 | Return on Equity |
| Northern States Power Company d/b/a Xcel Energy | 1/16 | Northern States Power Company | Docket No. E002/GR-15-826 | Industry Perspective |
| **Missouri House Committee on Energy and the Environment** | | | | |
| Ameren Missouri | 3/16 | Ameren Missouri | HB 2816 | Performance Based Ratemaking |
| **Missouri Public Service Commission** | | | | |
| Missouri Gas Energy | 1/03<br>04/03 | Missouri Gas Energy | Case No. GR-2001-382 | Gas Purchasing Practices, Prudence |
| Aquila Networks | 2/04 | Aquila-MPS, Aquila L&P | Case Nos. ER-2004-0034<br>HR-2004-0024 | Cost of Capital, Capital Structure |
| Aquila Networks | 2/04 | Aquila-MPS, Aquila L&P | Case No. GR-2004-0072 | Cost of Capital, Capital Structure |

| SPONSOR | DATE | CASE/APPLICANT | DOCKET NO. | SUBJECT |
|---|---|---|---|---|
| Missouri Gas Energy | 11/05<br>2/06<br>7/06 | Missouri Gas Energy | Case Nos. GR-2002-348<br>GR-2003-0330 | Capacity Planning |
| Missouri Gas Energy | 11/10<br>1/11 | KCP&L | Case No. ER-2010-0355 | Natural Gas DSM |
| Missouri Gas Energy | 11/10<br>1/11 | KCP&L GMO | Case No. ER-2010-0356 | Natural Gas DSM |
| Laclede Gas Company | 5/11 | Laclede Gas Company | Case No. CG-2011-0098 | Affiliate Pricing Standards |
| Union Electric Company d/b/a Ameren Missouri | 2/12<br>8/12 | Union Electric Company | Case No. ER-2012-0166 | ROE, Earnings Attrition, Regulatory Lag |
| Union Electric Company d/b/a Ameren Missouri | 6/14 | Noranda Aluminum Inc. | Case No. EC-2014-0223 | Ratemaking, Regulatory and Economic Policy |
| Union Electric Company d/b/a Ameren Missouri | 1/15<br>2/15 | Union Electric Company | Case No. ER-2014-0258 | Revenue Requirements, Ratemaking Policies |
| Great Plains Energy<br>Kansas City Power and Light Company | 8/17<br>2/18<br>3/18 | Great Plains Energy, Kansas City Power & Light Company, and Westar Energy | Docket No. EM-2018-0012 | Merger Standards, Transaction Value, Merger Benefits, Ring-Fencing, |
| **Missouri Senate Committee on Commerce, Consumer Protection, Energy and the Environment** | | | | |
| Ameren Missouri | 3/16 | Ameren Missouri | SB 1028 | Performance Based Ratemaking |
| **Montana Public Service Commission** | | | | |
| Great Falls Gas Company | 10/82 | Great Falls Gas Company | Docket No. 82-4-25 | Gas Rate Adjustment Clause |
| **National Energy Board of Canada** | | | | |
| Alberta-Northeast | 2/87 | Alberta Northeast Gas Export Project | Docket No. GH-1-87 | Gas Export Markets |
| Alberta-Northeast | 11/87 | TransCanada Pipeline | Docket No. GH-2-87 | Gas Export Markets |
| Alberta-Northeast | 1/90 | TransCanada Pipeline | Docket No. GH-5-89 | Gas Export Markets |
| Independent Petroleum Association of Canada | 1/92 | Interprovincial Pipe Line, Inc. | RH-2-91 | Pipeline Valuation, Toll |

| SPONSOR | DATE | CASE/APPLICANT | DOCKET NO. | SUBJECT |
|---|---|---|---|---|
| The Canadian Association of Petroleum Producers | 11/93 | Transmountain Pipe Line | RH-1-93 | Cost of Capital |
| Alliance Pipeline L.P. | 6/97 | Alliance Pipeline L.P. | GH-3-97 | Market Study |
| Maritimes & Northeast Pipeline | 97 | Sable Offshore Energy Project | GH-6-96 | Market Study |
| Maritimes & Northeast Pipeline | 2/02 | Maritimes & Northeast Pipeline | GH-3-2002 | Natural Gas Demand Analysis |
| TransCanada Pipelines | 8/04 | TransCanada Pipelines | RH-3-2004 | Toll Design |
| Brunswick Pipeline | 5/06 | Brunswick Pipeline | GH-1-2006 | Market Study |
| TransCanada Pipelines Ltd. | 12/06<br>4/07 | TransCanada Pipelines Ltd.: Gros Cacouna Receipt Point Application | RH-1-2007 | Toll Design |
| Repsol Energy Canada Ltd | 3/08 | Repsol Energy Canada Ltd | GH-1-2008 | Market Study |
| Maritimes & Northeast Pipeline | 7/10 | Maritimes & Northeast Pipeline | RH-4-2010 | Regulatory Policy, Toll Development |
| TransCanada Pipelines Ltd | 9/11<br>5/12 | TransCanada Pipelines Ltd. | RH-3-2011 | Business Services and Tolls Application |
| Trans Mountain Pipeline LLC | 6/12<br>1/13 | Trans Mountain Pipeline LLC | RH-1-2012 | Toll Design |
| TransCanada Pipelines Ltd | 8/13 | TransCanada Pipelines Ltd | RE-001-2013 | Toll Design |
| NOVA Gas Transmission Ltd | 11/13 | NOVA Gas Transmission Ltd | OF-Fac-Gas-N081-2013-10 01 | Toll Design |
| Trans Mountain Pipeline LLC | 12/13 | Trans Mountain Pipeline LLC | OF-Fac-Oil-T260-2013-03 01 | Economic and Financial Feasibility, Project Benefits |
| Energy East Pipeline Ltd. | 10/14 | Energy East Pipeline | Of-Fac-Oil-E266-2014-01 02 | Economic and Financial Feasibility, Project Benefits |
| NOVA Gas Transmission Ltd | 5/16 | NOVA Gas Transmission Ltd | GH-003-2015 | Certificate of Public Convenience and Necessity |
| TransCanada PipeLines Limited | 4/17<br>9/17 | TransCanada PipeLines Limited | Dawn LTFP Service Application | Public Interest, Toll Design |
| NOVA Gas Transmission Ltd | 10/17 | NOVA Gas Transmission Ltd | MH-031-2017 | Toll Design |

| SPONSOR | DATE | CASE/APPLICANT | DOCKET NO. | SUBJECT |
|---|---|---|---|---|
| NOVA Gas Transmission Ltd | 3/19 | NOVA Gas Transmission Ltd | System Rate Design and Services Application | Tolling Changes |
| **New Brunswick Energy and Utilities Board** | | | | |
| Atlantic Wallboard/JD Irving Co | 1/08 | Enbridge Gas New Brunswick | MCTN #298600 | Rate Setting for EGNB |
| Atlantic Wallboard/Flakeboard | 9/09<br>6/10<br>7/10 | Enbridge Gas New Brunswick | NBEUB 2009-017 | Rate Setting for EGNB |
| Atlantic Wallboard/Flakeboard | 1/14 | Enbridge Gas New Brunswick | NBEUB Matter 225 | Rate Setting for EGNB |
| **NH Public Utilities Commission** | | | | |
| Bus & Industry Association | 6/89 | P.S. Co. of New Hampshire | Docket No. DR89-091 | Fuel Costs |
| Bus & Industry Association | 5/90 | Northeast Utilities | Docket No. DR89-244 | Merger & Acquisition Issues |
| Eastern Utilities Associates | 6/90 | Eastern Utilities Associates | Docket No. DF89-085 | Merger & Acquisition Issues |
| EnergyNorth Natural Gas | 12/90 | EnergyNorth Natural Gas | Docket No. DE90-166 | Gas Purchasing Practices |
| EnergyNorth Natural Gas | 7/90 | EnergyNorth Natural Gas | Docket No. DR90-187 | Special Contracts, Discounted Rates |
| Northern Utilities, Inc. | 12/91 | Commission Investigation | Docket No. DR91-172 | Generic Discounted Rates |
| Public Service Co. of New Hampshire | 7/14 | Public Service Co. of NH | Docket No. DE 11-250 | Prudence |
| Public Service Co. of New Hampshire | 7/15<br>11/15 | Public Service Co. of NH | Docket No. 14-238 | Restructuring and Rate Stabilization |
| **New Jersey Board of Public Utilities** | | | | |
| Hilton/Golden Nugget | 12/83 | Atlantic Electric | B.P.U. 832-154 | Line Extension Policies |
| Golden Nugget | 3/87 | Atlantic Electric | B.P.U. No. 837-658 | Line Extension Policies |

| SPONSOR | DATE | CASE/APPLICANT | DOCKET NO. | SUBJECT |
|---|---|---|---|---|
| New Jersey Natural Gas | 2/89 | New Jersey Natural Gas | B.P.U. GR89030335J | Cost Allocation, Rate Design |
| New Jersey Natural Gas | 1/91 | New Jersey Natural Gas | B.P.U. GR90080786J | Cost Allocation, Rate Design |
| New Jersey Natural Gas | 8/91 | New Jersey Natural Gas | B.P.U. GR91081393J | Rate Design, Weather Normalization Clause |
| New Jersey Natural Gas | 4/93 | New Jersey Natural Gas | B.P.U. GR93040114J | Cost Allocation, Rate Design |
| South Jersey Gas | 4/94 | South Jersey Gas | BRC Dock No. GR080334 | Revised Levelized Gas Adjustment |
| New Jersey Utilities Association | 9/96 | Commission Investigation | BPU AX96070530 | PBOP Cost Recovery |
| Morris Energy Group | 11/09 | Public Service Electric & Gas | BPU GR 09050422 | Discriminatory Rates |
| New Jersey American Water Co. | 4/10 | New Jersey American Water Co. | BPU WR 1040260 | Tariff Rates and Revisions |
| Electric Customer Group | 1/11 | Generic Stakeholder Proceeding | BPU GR10100761 and ER10100762 | Natural Gas Ratemaking Standards and pricing |
| **New Mexico Public Service Commission** | | | | |
| Gas Company of New Mexico | 11/83 | Public Service Co. of New Mexico | Docket No. 1835 | Cost Allocation, Rate Design |
| Southwestern Public Service Co., New Mexico | 12/12 | SPS New Mexico | Case No. 12-00350-UT | Rate Case, Return on Equity |
| PNM Resources | 12/13<br>10/14<br>12/14 | Public Service Co. of New Mexico | Case No. 13-00390-UT | Nuclear Valuation, In Support of Stipulation |
| **New York State Public Service Commission** | | | | |
| Iroquois Gas Transmission | 12/86 | Iroquois Gas Transmission System | Case No. 70363 | Gas Markets |
| Brooklyn Union Gas Company | 8/95 | Brooklyn Union Gas Company | Case No. 95-6-0761 | Panel on Industry Directions |

| SPONSOR | DATE | CASE/APPLICANT | DOCKET NO. | SUBJECT |
|---|---|---|---|---|
| Central Hudson, ConEdison and Niagara Mohawk | 9/00 | Central Hudson, ConEdison and Niagara Mohawk | Case No. 96-E-0909<br>Case No. 96-E-0897<br>Case No. 94-E-0098<br>Case No. 94-E-0099 | Section 70, Approval of New Facilities |
| Central Hudson, New York State Electric & Gas, Rochester Gas & Electric | 5/01 | Joint Petition of NiMo, NYSEG, RG&E, Central Hudson, Constellation and Nine Mile Point | Case No. 01-E-0011 | Section 70, Rebuttal Testimony |
| Rochester Gas & Electric | 12/03 | Rochester Gas & Electric | Case No. 03-E-1231 | Sale of Nuclear Plant |
| Rochester Gas & Electric | 1/04 | Rochester Gas & Electric | Case No. 03-E-0765<br>Case No. 02-E-0198<br>Case No. 03-E-0766 | Sale of Nuclear Plant; Ratemaking Treatment of Sale |
| Rochester Gas and Electric and NY State Electric & Gas Corp | 2/10 | Rochester Gas & Electric<br>NY State Electric & Gas Corp | Case No. 09-E-0715<br>Case No. 09-E-0716<br>Case No. 09-E-0717<br>Case No. 09-E-0718 | Depreciation Policy |
| National Fuel Gas Corporation | 9/16<br>9/16 | National Fuel Gas Corporation | Case No. 16-G-0257 | Ring-fencing Policy |
| NextEra Energy Transmission New York | 8/18 | NextEra Energy Transmission New York | Case No. 18-T-0499 | Certificate of Need for Transmission Line, Vertical Market Power |
| **Nova Scotia Utility and Review Board** | | | | |
| Nova Scotia Power | 9/12 | Nova Scotia Power | Docket No. P-893 | Audit Reply |
| Nova Scotia Power | 8/14 | Nova Scotia Power | Docket No. P-887 | Audit Reply |
| Nova Scotia Power | 5/16 | Nova Scotia Power | 2017-2019 Fuel Stability Plan | Used and Useful Ratemaking |
| NSP Maritime Link ("NSPML") | 12/16<br>2/17<br>5/17 | NSP Maritime Link ("NSPML") | NSPML Interim Cost Assessment Application | Used and Useful Ratemaking |
| **Oklahoma Corporation Commission** | | | | |
| Oklahoma Natural Gas Company | 6/98 | Oklahoma Natural Gas Company | Case PUD No. 980000177 | Storage Issues |

| SPONSOR | DATE | CASE/APPLICANT | DOCKET NO. | SUBJECT |
|---|---|---|---|---|
| Oklahoma Gas & Electric Company | 5/05<br>9/05 | Oklahoma Gas & Electric Company | Cause No. PUD 200500151 | Prudence of McLain Acquisition |
| Oklahoma Gas & Electric Company | 3/08 | Oklahoma Gas & Electric Company | Cause No. PUD 200800086 | Acquisition of Redbud Generating Facility |
| Oklahoma Gas & Electric Company | 8/14<br>1/15 | Oklahoma Gas & Electric Company | Cause No. PUD 201400229 | Integrated Resource Plan |
| **Ontario Energy Board** | | | | |
| Market Hub Partners Canada, L.P. | 5/06 | Natural Gas Electric Interface Roundtable | File No. EB-2005-0551 | Market-based Rates for Storage |
| Ontario Power Generation | 9/13<br>2/14<br>5/14 | Ontario Power Generation | EB-2013-0321 | Prudence Review of Nuclear Project Management Processes |
| **Oregon Public Utilities Commission** | | | | |
| Hydro One Limited and Avista Corporation | 8/18<br>10/18 | Hydro One Limited and Avista Corporation | Docket No. UM 1897 | Reasonableness and Sufficiency of the Governance, Bankruptcy, and Financial Ring-Fencing Stipulated Settlement Commitments |
| **Pennsylvania Public Utility Commission** | | | | |
| ATOC | 4/95 | Equitrans | Docket No. R-00943272 | Rate Design, Unbundling |
| ATOC | 3/96<br>4/96 | Equitrans | Docket No. P-00940886 | Rate Design, Unbundling |
| **Rhode Island Public Utilities Commission** | | | | |
| Newport Electric | 7/81 | Newport Electric | Docket No. 1599 | Rate Attrition |
| South County Gas | 9/82 | South County Gas | Docket No. 1671 | Cost of Capital |
| New England Energy Group | 7/86 | Providence Gas Company | Docket No. 1844 | Cost Allocation, Rate Design |
| Providence Gas | 8/88 | Providence Gas Company | Docket No. 1914 | Load Forecast, Least-Cost Planning |

| SPONSOR | DATE | CASE/APPLICANT | DOCKET NO. | SUBJECT |
|---|---|---|---|---|
| Providence Gas Company and The Valley Gas Company | 1/01<br>3/02 | Providence Gas Company and The Valley Gas Company | Docket No. 1673 and 1736 | Gas Cost Mitigation Strategy |
| The New England Gas Company | 3/03 | New England Gas Company | Docket No. 3459 | Cost of Capital |
| **Texas Public Utility Commission** | | | | |
| Southwestern Electric | 5/83 | Southwestern Electric | | Cost of Capital, CWIP |
| P.U.C. General Counsel | 11/90 | Texas Utilities Electric Company | Docket No. 9300 | Gas Purchasing Practices, Prudence |
| Oncor Electric Delivery Company | 8/07 | Oncor Electric Delivery Company | Docket No. 34040 | Regulatory Policy, Rate of Return, Return of Capital and Consolidated Tax Adjustment |
| Oncor Electric Delivery Company | 6/08 | Oncor Electric Delivery Company | Docket No.35717 | Regulatory policy |
| Oncor Electric Delivery Company | 10/08<br>11/08 | Oncor, TCC, TNC, ETT, LCRA TSC, Sharyland, STEC, TNMP | Docket No. 35665 | Competitive Renewable Energy Zone |
| CenterPoint Energy | 6/10<br>10/10 | CenterPoint Energy/Houston Electric | Docket No. 38339 | Regulatory Policy, Risk, Consolidated Taxes |
| Oncor Electric Delivery Company | 1/11 | Oncor Electric Delivery Company | Docket No. 38929 | Regulatory Policy, Risk |
| Cross Texas Transmission | 8/12<br>11/12 | Cross Texas Transmission | Docket No. 40604 | Return on Equity |
| Southwestern Public Service | 11/12 | Southwestern Public Service | Docket No. 40824 | Return on Equity |
| Lone Star Transmission | 5/14 | Lone Star Transmission | Docket No. 42469 | Return on Equity, Debt, Cost of Capital |
| CenterPoint Energy Houston Electric, LLC | 6/15 | CenterPoint Energy Houston Electric, LLC | Docket No. 44572 | Distribution Cost Recovery Factor |
| NextEra Energy, Inc. | 10/16<br>2/17 | Oncor Electric Delivery Company LLC, NextEra Energy | Docket No. 46238 | Merger Application, Ring-fencing, Affiliate Interest, Code of Conduct |

| SPONSOR | DATE | CASE/APPLICANT | DOCKET NO. | SUBJECT |
|---|---|---|---|---|
| **Texas Railroad Commission** | | | | |
| Western Gas Interstate Company | 1/85 | Southern Union Gas Company | Docket 5238 | Cost of Service |
| Atmos Pipeline Texas | 9/10<br>1/11 | Atmos Pipeline Texas | GUD 10000 | Ratemaking Policy, Risk |
| Atmos Pipeline Texas | 1/17<br>4/17 | Atmos Pipeline Texas | GUD 10580 | Ratemaking Policy, ROE, Rate Design Policy |
| **Texas State Legislature** | | | | |
| CenterPoint Energy | 4/13 | Association of Electric Companies of Texas | SB 1364 | Consolidated Tax Adjustment Clause Legislation |
| **Utah Public Service Commission** | | | | |
| AMAX Magnesium | 1/88 | Mountain Fuel Supply Company | Case No. 86-057-07 | Cost Allocation, Rate Design |
| AMAX Magnesium | 4/88 | Utah P&L/Pacific P&L | Case No. 87-035-27 | Merger & Acquisition |
| Utah Industrial Group | 7/90<br>8/90 | Mountain Fuel Supply | Case No. 89-057-15 | Gas Transportation Rates |
| AMAX Magnesium | 9/90 | Utah Power & Light | Case No. 89-035-06 | Energy Balancing Account |
| AMAX Magnesium | 8/90 | Utah Power & Light | Case No. 90-035-06 | Electric Service Priorities |
| Questar Gas Company | 12/07 | Questar Gas Company | Docket No. 07-057-13 | Benchmarking in Support of ROE |
| **Vermont Public Service Board** | | | | |
| Green Mountain Power | 8/82 | Green Mountain Power | Docket No. 4570 | Rate Attrition |
| Green Mountain Power | 12/97 | Green Mountain Power | Docket No. 5983 | Cost of Service |
| Green Mountain Power | 7/98<br>9/00 | Green Mountain Power | Docket No. 6107 | Rate Development |

| SPONSOR | DATE | CASE/APPLICANT | DOCKET NO. | SUBJECT |
|---|---|---|---|---|
| **Washington Utilities and Transportation Commission** | | | | |
| Hydro One Limited and Avista Corporation | 9/18 | Hydro One Limited and Avista Corporation | Docket No. U-170970 | Reasonableness and Sufficiency of the Governance, Bankruptcy, and Financial Ring-Fencing Stipulated Settlement Commitments |
| **Wisconsin Public Service Commission** | | | | |
| WEC & WICOR | 11/99 | WEC | Docket No. 9401-YO-100<br>Docket No. 9402-YO-101 | Approval to Acquire the Stock of WICOR |
| Wisconsin Electric Power Company | 1/07 | Wisconsin Electric Power Co. | Docket No. 6630-EI-113 | Sale of Nuclear Plant |
| Wisconsin Electric Power Company | 10/09 | Wisconsin Electric Power Co. | Docket No. 6630-CE-302 | CPCN Application for Wind Project |
| Northern States Power Wisconsin | 10/13 | Xcel Energy (dba Northern States Power Wisconsin) | Docket No. 4220-UR-119 | Fuel Cost Adjustments |
| Wisconsin Electric Power Company | 11/13 | Wisconsin Electric Power Co. | Docket No. 6630-FR-104 | Fuel Cost Adjustment |
| Wisconsin Gas LLC | 5/14 | Wisconsin Gas LLC | Docket No. 6650-CG-233 | Gas Line Expansion, Reasonableness |
| WE Energy | 8/14<br>1/15<br>3/15 | WE Energy/Integrys | Docket No. 9400-YO-100 | Merger Approval |
| Wisconsin Public Service Corporation | 1/19 | Madison Gas and Electric Company and Wisconsin Public Service Corporation | Docket No. 5-BS-228 | Evaluation of Models Used in Resource Investment Decisions |

| SPONSOR | DATE | CASE/APPLICANT | DOCKET NO. | SUBJECT |
|---|---|---|---|---|
| **American Arbitration Association** | | | | |
| Michael Polsky | 3/91 | M. Polsky vs. Indeck Energy | | Corporate Valuation, Damages |
| ProGas Limited | 7/92 | ProGas Limited v. Texas Eastern | | Gas Contract Arbitration |
| Attala Generating Company | 12/03 | Attala Generating Co v. Attala Energy Co. | Case No. 16-Y-198-00228-03 | Power Project Valuation, Breach of Contract, Damages |
| Nevada Power Company | 4/08 | Nevada Power v. Nevada Cogeneration Assoc. #2 | | Power Purchase Agreement |
| Sensata Technologies, Inc./EMS Engineered Materials Solutions, LLC | 1/11 | Sensata Technologies, Inc./EMS Engineered Materials Solutions, LLC v. Pepco Energy Services | Case No. 11-198-Y-00848-10 | Change in Usage Dispute, Damages |
| Sandy Creek Energy Associates, L.P. | 9/17 | Sandy Creek Energy Associates, L.P. vs. Lower Colorado River Authority | Case No. 01-16-0002-6892 | Power Purchase Agreement, Analysis of Damages |
| **Canadian Arbitration Panel** | | | | |
| Hydro-Québec | 4/15<br>5/16<br>7/16 | Hydro-Fraser et al v. Hydro-Québec | | Electric Price Arbitration |
| **Commonwealth of Massachusetts, Appellate Tax Board** | | | | |
| NStar Electric Company | 8/14 | NStar Electric Company | Docket No. F316346<br>Docket No. F319254 | Valuation Methodology |
| Western Massachusetts Electric Company | 2/16 | Western Massachusetts Electric Company v. Board of Assessors of The City of Springfield | Docket No. 315550<br>Docket No. 319349 | Valuation Methodology |
| **Commonwealth of Massachusetts, Suffolk Superior Court** | | | | |
| John Hancock | 1/84 | Trinity Church v. John Hancock | C.A. No. 4452 | Damages Quantification |

| SPONSOR | DATE | CASE/APPLICANT | DOCKET NO. | SUBJECT |
|---|---|---|---|---|
| **Court of Common Pleas of Philadelphia County, Civil Division** | | | | |
| Sunoco Marketing & Terminals L.P. | 11/16 | Sunoco Marketing & Terminals, L.P. v. South Jersey Resources Group | Case No. 150302520 | Damages Quantification |
| **State of Colorado District Court, County of Garfield** | | | | |
| Questar Corporation, et al | 11/00 | Questar Corporation, et al. | Case No. 00CV129-A | Partnership Fiduciary Duties |
| **State of Delaware, Court of Chancery, New Castle County** | | | | |
| Wilmington Trust Company | 11/05 | Calpine Corporation vs. Bank of New York and Wilmington Trust Company | C.A. No. 1669-N | Bond Indenture Covenants |
| **Illinois Appellate Court, Fifth Division** | | | | |
| Norweb, PLC | 8/02 | Indeck No. America v. Norweb | Docket No. 97 CH 07291 | Breach of Contract, Power Plant Valuation |
| **Independent Arbitration Panel** | | | | |
| Alberta Northeast Gas Limited | 2/98 | ProGas Ltd., Canadian Forest Oil Ltd., AEC Oil & Gas | | |
| Ocean State Power | 9/02 | Ocean State Power vs. ProGas Ltd. | 2001/2002 Arbitration | Gas Price Arbitration |
| Ocean State Power | 2/03 | Ocean State Power vs. ProGas Ltd. | 2002/2003 Arbitration | Gas Price Arbitration |
| Ocean State Power | 6/04 | Ocean State Power vs. ProGas Ltd. | 2003/2004 Arbitration | Gas Price Arbitration |
| Shell Canada Limited | 7/05 | Shell Canada Limited and Nova Scotia Power Inc. | | Gas Contract Price Arbitration |
| **International Court of Arbitration** | | | | |
| Wisconsin Gas Company, Inc. | 2/97 | Wisconsin Gas Co. vs. Pan-Alberta | Case No. 9322/CK | Contract Arbitration |
| Minnegasco, A Division of NorAm Energy Corp. | 3/97 | Minnegasco vs. Pan-Alberta | Case No. 9357/CK | Contract Arbitration |

| SPONSOR | DATE | CASE/APPLICANT | DOCKET NO. | SUBJECT |
|---|---|---|---|---|
| Utilicorp United Inc. | 4/97 | Utilicorp vs. Pan-Alberta | Case No. 9373/CK | Contract Arbitration |
| IES Utilities | 97 | IES vs. Pan-Alberta | Case No. 9374/CK | Contract Arbitration |
| Mitsubishi Heavy Industries, Ltd., and Mitsubishi Nuclear Energy Systems, Inc. | 12/15<br>2/16 | Southern California Edison Company, Edison Material Supply LLC, San Diego Gas & Electric Co., and the City of Riverside vs. Mitsubishi Heavy Industries, Ltd., and Mitsubishi Nuclear Energy Systems, Inc. | Case No. 19784/AGF/RD | Damages Arising Under a Nuclear Power Equipment Contract |
| **International Chamber of Commerce** | | | | |
| Senvion GmbH | 4/17 | Senvion GmbH v. EDF Renewable Energy, Inc. | Case No. 01-15-0005-4590 | Breach-Related Damages, Unfair Competition, Unjust Enrichment |
| Senvion GmbH | 9/17 | Senvion GmbH v. EEN CA Lac Alfred Limited Partnership, et al. | Case No. 21535 | Breach-Related Damages |
| Senvion GmbH | 12/17 | Senvion GmbH v. EEN CA Massif du Sud Limited Partnership, et al. | Case No. 21536 | Breach-Related Damages |
| **State of New Jersey, Mercer County Superior Court** | | | | |
| Transamerica Corp., et al. | 7/07<br>10/07 | IMO Industries Inc. vs. Transamerica Corp., et al. | Docket No. L-2140-03 | Breach-Related Damages, Enterprise Value |
| **State of New York, Nassau County Supreme Court** | | | | |
| Steel Los III, LP | 6/08 | Steel Los II, LP & Associated Brook, Corp v. Power Authority of State of NY | Index No. 5662/05 | Property Seizure |
| **Province of Alberta, Court of Queen's Bench** | | | | |
| Alberta Northeast Gas Limited | 5/07 | Cargill Gas Marketing Ltd. vs. Alberta Northeast Gas Limited | Action No. 0501-03291 | Gas Contracting Practices |

| SPONSOR | DATE | CASE/APPLICANT | DOCKET NO. | SUBJECT |
|---|---|---|---|---|
| **Quebec Superior Court, District of Gaspé** | | | | |
| Senvion Canada and Senvion GmbH | 2/19 | Senvion Canada and Senvion GmbH v. Suspendem Rope Access | | Breach-Related Damages, Reimbursement of Liquidated Damages, Reimbursement of Scheduled Maintenance Penalties |
| **State of New Hampshire, Judicial Court-Rockingham Superior Court** | | | | |
| Public Service Company of New Hampshire d/b/a Eversource Energy | 10/18 | Public Service Company of New Hampshire d/b/a Eversource Energy v. City of Portsmouth | Case No. 218-2016-CV-00899 Case No. 218-2017-CV-00917 | Valuation of Transmission and Distribution Assets |
| **State of Rhode Island, Providence City Court** | | | | |
| Aquidneck Energy | 5/87 | Laroche vs. Newport | | Least-Cost Planning |
| **State of Texas, Hutchinson County Court** | | | | |
| Western Gas Interstate | 5/85 | State of Texas vs. Western Gas Interstate Co. | Case No. 14,843 | Cost of Service |
| **State of Utah, Third District Court** | | | | |
| PacifiCorp & Holme, Roberts & Owen, LLP | 1/07 | USA Power & Spring Canyon Energy vs. PacifiCorp. et al. | Civil No. 050903412 | Breach-Related Damages |
| **U.S. Bankruptcy Court, District of New Hampshire** | | | | |
| EUA Power Corporation | 7/92 | EUA Power Corporation | Case No. BK-91-10525-JEY | Pre-Petition Solvency |
| **U.S. Bankruptcy Court, District of New Jersey** | | | | |
| Ponderosa Pine Energy Partners, Ltd. | 7/05 | Ponderosa Pine Energy Partners, Ltd. | Case No. 05-21444 | Forward Contract Bankruptcy Treatment |

| SPONSOR | DATE | CASE/APPLICANT | DOCKET NO. | SUBJECT |
|---|---|---|---|---|
| **U.S. Bankruptcy Court, No. District of New York** | | | | |
| Cayuga Energy, NYSEG Solutions, The Energy Network | 09/09 | Cayuga Energy, NYSEG Solutions, The Energy Network | Case No. 06-60073-6-sdg | Going Concern |
| **U.S. Bankruptcy Court, So. District of New York** | | | | |
| Johns Manville | 5/04 | Enron Energy Mktg. v. Johns Manville;<br>Enron No. America v. Johns Manville | Case No. 01-16034 (AJG) | Breach of Contract, Damages |
| **U.S. Bankruptcy Court, Northern District of Texas** | | | | |
| Southern Maryland Electric Cooperative, Inc., and Potomac Electric Power Company | 11/04 | Mirant Corporation, et al. v. SMECO | Case No. 03-4659; Adversary No. 04-4073 | PPA Interpretation, Leasing |
| **U.S. Court of Federal Claims** | | | | |
| Boston Edison Company | 7/06<br>11/06 | Boston Edison Company v. United States | No. 99-447C<br>No. 03-2626C | Spent Nuclear Fuel Breach, Damages |
| Consolidated Edison Company | 7/07 | Consolidated Edison Company | No. 06-305T | Evaluation of Lease Purchase Option |
| Consolidated Edison Company | 2/08<br>6/08 | Consolidated Edison Company v. United States | No. 04-0033C | Spent Nuclear Fuel Breach, Damages |
| Vermont Yankee Nuclear Power Corporation | 6/08 | Vermont Yankee Nuclear Power Corporation v. United States | No. 03-2663C | Spent Nuclear Fuel Breach, Damages |
| **U. S. District Court, Boulder County, Colorado** | | | | |
| KN Energy, Inc. | 3/93 | KN Energy vs. Colorado GasMark, Inc. | Case No. 92 CV 1474 | Gas Contract Interpretation |

| SPONSOR | DATE | CASE/APPLICANT | DOCKET NO. | SUBJECT |
|---|---|---|---|---|
| **U. S. District Court, Northern California** | | | | |
| Pacific Gas & Electric Co./PGT PG&E/PGT Pipeline Exp. Project | 4/97 | Norcen Energy Resources Limited | Case No. C94-0911 VRW | Fraud Claim |
| **U. S. District Court, District of Connecticut** | | | | |
| Constellation Power Source, Inc. | 12/04 | Constellation Power Source, Inc. v. Select Energy, Inc. | Civil Action 304 CV 983 (RNC) | ISO Structure, Breach of Contract |
| **U.S. District Court, Northern District of Illinois, Eastern Division** | | | | |
| U.S. Securities and Exchange Commission | 4/12 | U.S. Securities and Exchange Commission v. Thomas Fisher, Kathleen Halloran, and George Behrens | Case No. 07 C 4483 | Prudence, PBR |
| **U. S. District Court, Massachusetts** | | | | |
| Eastern Utilities Associates & Donald F. Pardus | 3/94 | NECO Enterprises Inc. vs. Eastern Utilities Associates | Civil Action No. 92-10355-RCL | Seabrook Power Sales |
| **U. S. District Court, Montana** | | | | |
| KN Energy, Inc. | 9/92 | KN Energy v. Freeport MacMoRan | Docket No. CV 91-40-BLG-RWA | Gas Contract Settlement |
| **U.S. District Court, New Hampshire** | | | | |
| Portland Natural Gas Transmission and Maritimes & Northeast Pipeline | 9/03 | Public Service Company of New Hampshire vs. PNGTS and M&NE Pipeline | Docket No. C-02-105-B | Impairment of Electric Transmission Right-of-Way |
| **U. S. District Court, Southern District of New York** | | | | |
| Central Hudson Gas & Electric | 11/99 8/00 | Central Hudson v. Riverkeeper, Inc., Robert H. Boyle, John J. Cronin | Civil Action 99 Civ 2536 (BDP) | Electric Restructuring, Environmental Impacts |
| Consolidated Edison | 3/02 | Consolidated Edison v. Northeast Utilities | Case No. 01 Civ. 1893 (JGK) (HP) | Industry Standards for Due Diligence |

| SPONSOR | DATE | CASE/APPLICANT | DOCKET NO. | SUBJECT |
|---|---|---|---|---|
| Merrill Lynch & Company | 1/05 | Merrill Lynch v. Allegheny Energy, Inc. | Civil Action 02 CV 7689 (HB) | Due Diligence, Breach of Contract, Damages |
| **U. S. District Court, Eastern District of Virginia** | | | | |
| Aquila, Inc. | 1/05<br>2/05 | VPEM v. Aquila, Inc. | Civil Action 304 CV 411 | Breach of Contract, Damages |
| **U. S. District Court, Western District of Virginia** | | | | |
| Washington Gas Light Company | 8/15<br>9/15 | Washington Gas Light Company v. Mountaineer Gas Company | Civil Action No. 5:14-cv-41 | Nominations and Gas Balancing, Lost and Unaccounted for Gas, Damages |
| **U. S. District Court, Portland Maine** | | | | |
| ACEC Maine, Inc. et al. | 10/91 | CIT Financial vs. ACEC Maine | Docket No. 90-0304-B | Project Valuation |
| Combustion Engineering | 1/92 | Combustion Eng. vs. Miller Hydro | Docket No. 89-0168P | Output Modeling, Project Valuation |
| **U.S. Securities and Exchange Commission** | | | | |
| Eastern Utilities Association | 10/92 | EUA Power Corporation | File No. 70-8034 | Value of EUA Power |
| **U.S. Tax Court in Illinois** | | | | |
| Exelon Corporation | 4/15<br>6/15 | Exelon Corporation, as Successor by Merger to Unicom Corporation and Subsidiaries et al. v. Commission of Internal Revenue | Docket Nos. 29183-13, 29184-13 | Valuation of Analysis of Lease Terms and Quantify Plant Values |
| **Council of the District of Columbia Committee on Consumer and Regulatory Affairs** | | | | |
| Potomac Electric Power Co. | 7/99 | Potomac Electric Power Co. | Bill 13-284 | Utility Restructuring |

| | | | | |
|---|---|---|---|---|
| **Alberta Beverage Container Management Board** | | | | |
| Alberta Beverage Container Management Board | 2016 | Expert for the Board | N/A | Return Margin on Bottle Depots |
| **Alberta Utilities Commission** | | | | |
| ATCO Utilities Group | 2008<br>2009 | ATCO Gas; ATCO Pipelines Ltd.; ATCO Electric Ltd. | Application No. 1578571 / Proceeding ID. 85 | 2009 Generic Cost of Capital Proceeding (Gas & Electric) |
| **American Arbitration Association** | | | | |
| TransCanada Corporation | 2004 | TransCanada Corporation | AAA Case No. 50T 1810018804 | Valuation of Natural Gas Pipeline |
| **British Columbia Utilities Commission** | | | | |
| FortisBC | 2012 | FortisBC Utilities | G-20-12 | Cost of Capital Adjustment Mechanisms |
| FortisBC | 2015<br>2016 | FortisBC Utilities | Project 3698852 | Cost of Capital (Gas Distribution) |
| **Connecticut Department of Public Utility Control** | | | | |
| Aquarion Water Company of CT/ Macquarie Securities | 2007 | Aquarion Water Company of CT | DPUC Docket No. 07-05-19 | Return on Equity (Water) |
| **Federal Energy Regulatory Commission** | | | | |
| Atlantic Power Corporation | 2007 | Atlantic Path 15, LLC | ER08-374-000 | Return on Equity (Electric) |
| Atlantic Power Corporation | 2010 | Atlantic Path 15, LLC | Docket No. ER11-2909-000 | Return on Equity (Electric) |
| Atlantic Power Corporation | 2011 | Atlantic Path 15, LLC | Docket Nos. ER11-2909 and EL11-29 | Rate of Return (Electric Transmission) |
| Startrans IO, LLC | 2012 | Startrans IO, LLC | ER-13-272-000 | Cost of Capital (Electric Transmission) |
| Startrans IO, LLC | 2015 | Startran IO, LLC | ER-16-194-000 and EL16-25-000 | Cost of Capital (Electric Transmission) |
| **Hawaii Public Utility Commission** | | | | |
| The Gas Company | 2017 | The Gas Company | Docket No. 2017-0105 | Cost of Capital (Gas Distribution) |

| | | | | |
|---|---|---|---|---|
| **Maine Public Utilities Commission** | | | | |
| Bangor Hydro Electric Company | 1998 | Bangor Hydro Electric Company | MPUC Docket No. 98-820 | Transaction-Related Financial Advisory Services, Valuation |
| Central Maine Power Company | 2007 | Central Maine Power Company | MPUC Docket No. 2007-215 | Sales Forecast |
| **Maryland State Board of Contract Appeals** | | | | |
| Green Planet Power Solutions | 2018 | Green Planet Power Solutions and Maryland Bio Eneregy LLC v. Maryland Department of General Services | MSBCA 3061 | Contract Litigation, Power Purchase Agreement, Damages Analysis |
| **Massachusetts Superior Court** | | | | |
| Burncoat Pond Watershed District | 2010 | Central Water District v. Burncoat Pond Watershed District | WDCV 2001-0105 | Valuation/Eminent Domain |
| **Minnesota Public Utilities Commission** | | | | |
| Northern States Power Company | 2015<br>2016 | Northern States Power Company | E-002-GR-15-826 | Cost of Capital (Electric) |
| Northern States Power Company | 2017 | Northern States Power Company | | Cost of Capital (Electric and Gas Rate Riders for Transmission, Renewable Generation and Gas Distribution) |
| **Newfoundland and Labrador Board of Commissioners of Public Utilities** | | | | |
| Newfoundland Power | 2016<br>2018 | Newfoundland Power | 2016 GRA<br>2018 GRA | Cost of Capital (Electric) |
| **New Jersey Board of Public Utilities** | | | | |
| Conectiv | 2000-2001 | Atlantic City Electric Company | NJBPU Docket No. EM00020106 | Transaction-Related Financial Advisory Services |
| **Nova Scotia Utility and Review Board** | | | | |
| Nova Scotia Power Inc. | 2012 | Nova Scotia Power Inc. | 2013 GRA | Return on Equity/Business Risk (Electric) |

| | | | | |
|---|---|---|---|---|
| **Ontario Energy Board** | | | | |
| Enbridge Gas Distribution and Hydro One Networks and the Coalition of Large Distributors | 2009 | Enbridge Gas Distribution and Hydro One Networks and the Coalition of Large Distributors | EB-2009-0084 | Ontario Energy Board's 2009 Consultative Process on Cost of Capital Review (Gas & Electric) |
| Enbridge Gas Distribution | 2012 | Enbridge Gas Distribution | EB-2011-0354 | Industry Benchmarking Study and Cost of Capital (Gas Distribution) |
| Enbridge Gas Distribution | 2014 | Enbridge Gas Distribution | EB-2012-0459 | Incentive Regulation Plan and Industry Productivity Study |
| Ontario Power Generation | 2016 | Ontario Power Generation | EB-2016-0152 | Cost of Capital (Electric Generation) |
| **Prince Edward Island Regulatory and Appeals Commission** | | | | |
| Maritime Electric Company | 2015 | Maritime Electric Company | UE20942 | Return on Capital (Electric) |
| **Régie de l'énergie du Québec** | | | | |
| Gaz Métro | 2012 | Gaz Métro | R-3809-2012 | Return on Equity/Business Risk/ Capital Structure (Gas Distribution) |
| Hydro-Québec Distribution and Hydro- Québec TransÉnergie | 2013 | Hydro-Québec Distribution and Hydro- Québec TransÉnergie | R-3842-2013 | Return on Equity/Business Risk (Electric) |
| Hydro-Québec Distribution | 2014 | Hydro-Québec Distribution | R-3905-2014 | Remuneration of Deferral Accounts |
| Hydro-Québec Distribution and Hydro- Québec TransÉnergie | 2015-2017 | Hydro-Québec Distribution and Hydro- Québec TransÉnergie | R-3897-2014 | Performance-Based Ratemaking |
| **South Dakota Public Service Commission** | | | | |
| Northern States Power Company-MN | 2012 | Northern States Power Company-MN | EL 11-019 | Return on Equity |
| **Texas Public Utility Commission** | | | | |
| Texas New Mexico Power Company | 2004 | Texas New Mexico Power Company | PUC Docket No. 29206 | Auction Process and Stranded Cost Recovery |
| **U.S. Department of Commerce** | | | | |
| Government of Québec | 2017 | Duty Investigation of Uncoated Groundwood Paper from Canada | PUC Docket No. 29206 | Contracting for Renewable Resources, Market Analysis, Damages Analysis |
| **Vermont Public Service Board** | | | | |
| Vermont Gas Systems, Inc. | 2006 | Vermont Gas Systems, Inc. | VPSB Docket No. 7109 | Models of Incentive Regulation |

| | | | | |
|---|---|---|---|---|
| Vermont Gas Systems, Inc. | 2012 | Vermont Gas Systems, Inc. | Docket No. 7803A | Cost of Capital (Gas Distribution) |
| Green Mountain Power Corporation | 2013 | Green Mountain Power Corporation | Docket No. 8191 | Return on Equity (Electric) |
| Vermont Gas Systems, Inc. | 2016 | Vermont Gas Systems, Inc. | Docket No. 8698/8710 | Return on Equity (Gas Distribution) |
| Green Mountain Power Corporation | 2017 | Green Mountain Power Corporation | Docket No. Tariff-8677 | Return on Equity (Electric) |
| **Wisconsin Public Service Commission** | | | | |
| Wisconsin Power and Light Company | 2007 | Wisconsin Power and Light Company | PSCW Docket No. 6680-CE-170 | Return on Equity (Electric) |
| Wisconsin Power and Light Company | 2007 | Wisconsin Power and Light Company | PSCW Docket No. 6680-CE-171 | Return on Equity (Electric) |
| Northern States Power Company | 2011 | Northern States Power Company | PSCW Docket No. 4220-UR-117 | Return on Equity (Electric) |
| Northern States Power Company | 2013 | Northern States Power Company | PSCW Docket No. 4220-UR-119 | Return on Equity (Gas & Electric) |
| Northern States Power Company | 2015 | Northern States Power Company | PSCW Docket No. 4220-UR-121 | Return on Equity (Gas & Electric) |
| Northern States Power Company | 2017 | Northern States Power Company | PSCW Docket No. 4220-UR-123 | Return on Equity (Gas & Electric) |
| **Yukon Utilities Board** | | | | |
| ATCO Electric Yukon | 2016 | ATCO Electric Yukon | 2016-2017 GRA | Return on Equity (Electric) |

# Exhibit SDG&E-Concentric-3
# Risk Premium Analyses

**PUBLIC VERSION**

## Analytical Assumptions

| Notes | Assumptions | |
|---|---|---|
| [1] | SDG&E's Modeled Financial Impact of Fire ($millions) | $3,680.00 |
| [2] | SDG&E Current Wildfire Coverage ($millions) | ($1,500) |
| [3] | SDG&E Transmission Labor Allocator in 2019 | 18.4% |
| [4] | CA Effective Tax Rate | 27.6% |
| [5] | SDG&E Requested Equity Ratio in 2019 Rate Case | 56.0% |
| [6] | SDG&E 2019 CPUC Rate Base ($millions) | $6,537.08 |
| [7] | SDG&E CPUC Equity Rate Base ($millions) | $3,660.76 |

**Notes**

[1] Company-provided data

[2] Company-provided data

[3] Company-provided data

[4] Source: "The United States' Corporate Income Tax Rate is Now More in Line with Those Levied by Other Major Nations", Tax Foundation, February 12, 2018, Table 1.

[5] SDG&E's requested equity ratio

[6] Source: Company Data

[7] Equals [5] x [6]

## Industry Risk Approach

| | [1] | [2] | [3] | [4] | [5] |
|---|---|---|---|---|---|
| Industry Name | Average Utility Beta ($\beta$) | Median Industry Beta ($\beta$) | Delta ($\beta$) | Market Risk Premium ($R_m - R_f$) | Risk Adjustment |
| Oilfield Svcs/Equip | 0.600 | 1.55 | 0.95 | 6.90% | 6.56% |
| Natural Gas (Div.) | 0.600 | 1.55 | 0.95 | 6.90% | 6.56% |
| Petroleum (Producing) | 0.600 | 1.40 | 0.80 | 6.90% | 5.52% |
| Maritime | 0.600 | 1.40 | 0.80 | 6.90% | 5.52% |
| Steel | 0.600 | 1.35 | 0.75 | 6.90% | 5.18% |
| Information Services | 0.600 | 1.00 | 0.40 | 6.90% | 2.76% |
| Entertainment | 0.600 | 1.00 | 0.40 | 6.90% | 2.76% |
| Insurance (Life) | 0.600 | 0.98 | 0.38 | 6.90% | 2.59% |

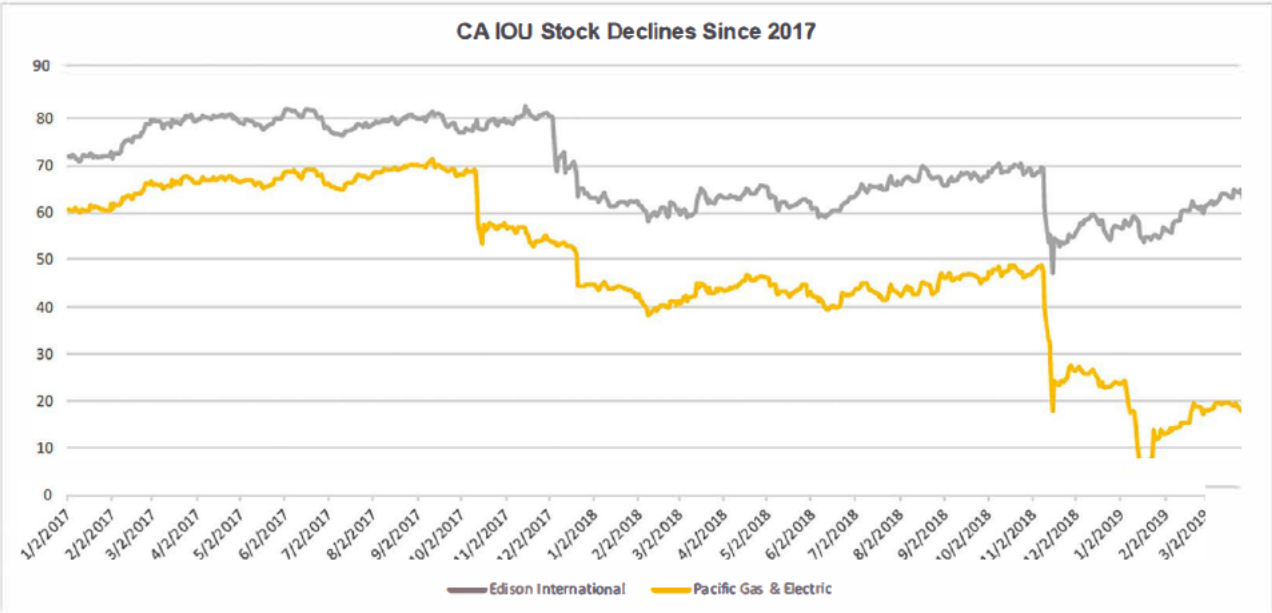
**Notes**

[1] Source: Dr. Morin's Testimony
[2] Median beta of each industry (Source: Value Line)
[3] Equals [2] - [1]
[4] Source: Dr. Morin's Testimony
[5] Equals [3] x [4]

**CA Utility Stock Declines Since 2017**

| Date | Edison International | Pacific Gas & Electric |
|---|---|---|
| Mar-19 | 63.24 | 18.73 |
| Feb-19 | 59.51 | 16.00 |
| Jan-19 | 56.25 | 14.04 |
| Dec-18 | 57.59 | 24.86 |
| Nov-18 | 58.17 | 32.44 |
| Oct-18 | 69.29 | 47.50 |
| Sep-18 | 67.46 | 46.32 |
| Aug-18 | 67.50 | 44.18 |
| Jul-18 | 65.58 | 43.33 |
| Jun-18 | 60.84 | 41.18 |
| May-18 | 62.33 | 43.67 |
| Apr-18 | 64.07 | 45.24 |
| Mar-18 | 61.99 | 43.10 |
| Feb-18 | 60.35 | 40.14 |
| Jan-18 | 62.41 | 43.91 |
| Dec-17 | 69.15 | 50.23 |
| Nov-17 | 80.49 | 55.34 |
| Oct-17 | 78.55 | 61.59 |
| Sep-17 | 79.70 | 69.54 |
| Aug-17 | 79.80 | 69.37 |
| Jul-17 | 77.74 | 66.52 |
| Jun-17 | 80.81 | 68.20 |
| May-17 | 79.20 | 66.60 |
| Apr-17 | 80.40 | 67.25 |
| Mar-17 | 79.47 | 66.40 |
| Feb-17 | 75.58 | 63.62 |
| Jan-17 | 71.98 | 60.85 |

Source: Bloomberg Professional Service



# Estimated Loss Approach

| Notes | Estimated Fire Above Insurance Coverage<br>Category | $ (millions) |
|---|---|---|
| [1] | SDG&E's Modeled Financial Impact of Fire ($millions) | $ 3,680 |
| [2] | SDG&E Wildfire Insurance | $ (1,500) |
| [3] | Wildfire Costs in Excess of Insurance | $ 2,180 |
| [4] | Less Amount - FERC Recovery | $ (401) |
| [5] | SDG&E Wildfire Liability Pre-Tax | $ 1,779 |
| [6] | **SDG&E Wildfire Liability Net of Tax** | **$ 1,287** |
| [7] | Probability of $3.68B Fire Per Year | 5.33% |

| Notes | Annualized Estimated Loss<br>Description | [6]<br>Net Estimated Fire Liabilities ($millions) | [8]<br>Annual Estimated Loss ($millions) |
|---|---|---|---|
| | SDG&E Wildfire Liability Net of Tax | $ 1,287 | $ 68.62 |

| Notes | 2019 Test Year Rate Base ($ millions) | |
|---|---|---|
| [9] | 2019 Projected SDG&E Rate Base | $ 6,537.08 |
| [10] | Equity Ratio | 56.0% |
| [11] | Equity Base | $ 3,660.76 |

| ROE Adjustment Based on Estimated Loss<br>Description | [6]<br>Net Estimated Fire Liabilities ($millions) | [12]<br>ROE Adjustment |
|---|---|---|
| SDG&E Wildfire Liability Net of Tax | $ 1,287 | 1.87% |

**Notes**

[1] See assumptions

[2] See assumptions

[3] Equals sum of [1] and [2]

[4] Equals [3] x FERC labor allocator [18.4%] (see assumptions)

[5] Equals sum of [3] and [4]

[6] Equals [5] x (1- Effective Tax Rate [27.6%])

[7] Expected probability of a $3.68B fire based on company modeling (Company-provided data)

[8] Equals [6] x [7]

[9] See assumptions

[10] See assumptions

[11] Equals [9] x [10]

[12] Equals [6] / [11] x [7]

## Insurance Approach

2018 Average Rate-On-Line (ROL) For Wildfire Insurance Renewals [redacted]

**Annualized Estimated Insurance Premium**

| Description | [1] Amount of Insurance ($ millions) | [2] Estimated Annual Premium $ millions) |
|---|---|---|
| Cost of Incremental Wildfire Insurance - $2.18B | $ 2,180 | [redacted] |

**Annualized Estimated Insurance Premium (Net of Tax)**

| Description | [1] Amount of Insurance ($ millions) | [3] Estimated Annual Premium (Net of Tax) |
|---|---|---|
| Cost of Incremental Wildfire Insurance - $2.18B | $ 1,578 | [redacted] |

| | | |
|---|---|---|
| [4] | SDG&E CPUC Equity Rate Base ($millions) | $ 3,661 |

**ROE Adjustment Based on Estimated Insurance Premium (Net of Tax)**

| Description | [1] Amount of Insurance ($ millions) | [5] ROE Adjustment |
|---|---|---|
| Cost of Incremental Wildfire Insurance - $2.18B | $ 1,578 | 3.68% |

**Notes**

[1] $2.18 billion represents the amount SDG&E would have to pay to fully cover unsinsured portion of $3.68 billion in liabilities.

[2] Dollar amounts equal (ROL) x (Amount of insurance)

[3] Equals [2] x (1-Effective Tax Rate [27.6%])

[4] See assumptions

[5] Equals [3] / [4]

## CAT Bond Approach

| | [1] | [2] | [3] | [4] |
|---|---|---|---|---|
| Dates | 3Y Treasury Bond Yield | SDG&E CAT Bond Yield | SDG&E CAT over 3Y Treasury | ROE Adjustment - CAT Over 3Y Treasury (Net of Tax) |
| 10/12/2018 | 2.93% | 6.44% | 3.51% | 2.54% |
| 12/10/2018 | 2.73% | 7.55% | 4.82% | 3.49% |
| 12/19/2018 | 2.61% | 7.60% | 4.99% | 3.61% |
| 3/5/2019 | 2.52% | 7.42% | 4.90% | 3.55% |
| 4/2/2019 | 2.26% | 7.63% | 5.37% | 3.89% |
| 4/3/2019 | 2.29% | 7.61% | 5.32% | 3.85% |
| **Last 2 Transaction Average** | | | 5.35% | 3.87% |

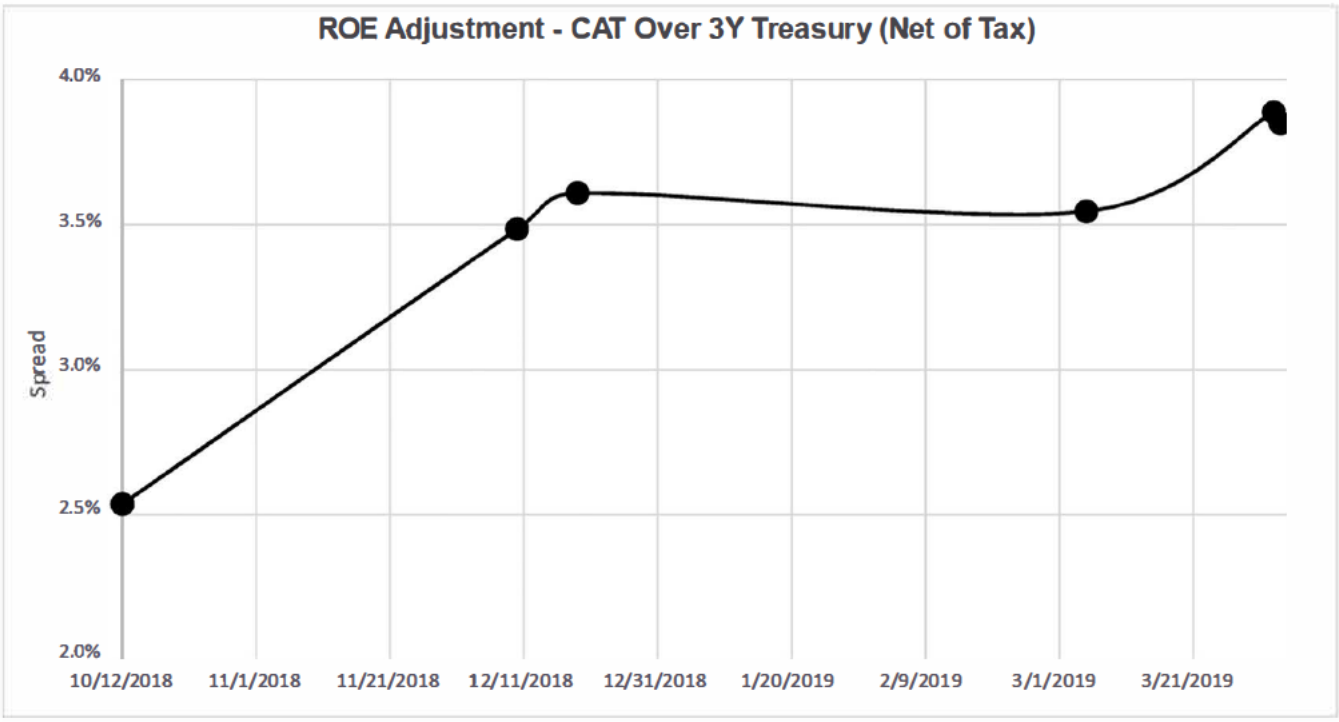
**Notes**

[1] Source: Bloomberg

[2] Source: Bloomberg SD RE Ltd (Series 2018 1). 6.44% is 400 basis points over LIBOR as of 10/12/18 [2.44%].

[3] Equals [2] [1]

[4] Equals [3] x (1-Effective Tax Rate [27.6%])



## California De-Risked Premium

| Notes | Scenario | Assumed Discount | [3] Dividend Yield | [4] Expected Dividend Yield | [5] Average Growth Rate | [6] Mean ROE | [7] ROE Adjustment |
|---|---|---|---|---|---|---|---|
| | Dr. Morin's Proxy Group Average | 0.00% | 3.33% | 3.52% | 5.83% | 9.35% | |
| [1] | Assuming 10% Discount in Stock Price | 10.00% | 3.70% | 3.92% | 5.83% | 9.75% | 0.39% |
| [2] | Assuming 20% Discount in Stock Price | 20.00% | 4.16% | 4.41% | 5.83% | 10.24% | 0.88% |

**Notes**

[1] 42% of investors survey by BAML ascribed a 10% discount to CA IOUs assuming wildfire liability construct is de-risked. (Source: BofAML - US Utilities & IPPs, Surveying Investors, pages 4-5, March 22, 2019)

[2] 28% of investors survey by BAML ascribed a 20% discount to CA IOUs assuming wildfire liability construct is de-risked. (Source: BofAML - US Utilities & IPPs, Surveying Investors, pages 4-5, March 22, 2019)

[3] Equals Morin Proxy Group's average dividend yield (3.33%) x (1-10%) and (3.33%) x (1-20%)

[4] Equals [3] x (1+ [5])

[5] Source: Dr. Morin's Testimony

[6] Equals [4] + [5]

[7] Equals [6] - Dr. Morin Mean DCF result (9.35%)

## Range of ROE Adjustment Results

| Notes | Approach Description | ROE Adjustment |
|---|---|---|
| [1] | Estimated Loss Approach | 1.87% |
| [2] | Insurance Approach | 3.68% |
| [3] | CAT Bond Approach | 3.87% |
| | **Mean** | **3.14%** |
| | **Median** | **3.68%** |
| | **Midpoint of Mean and Median** | **3.41%** |

**Notes**

[1] See Page 4

[2] See Page 5

[3] See Page 6

**BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA**

**DECLARATION OF KAREN L. SEDGWICK REGARDING CONFIDENTIALITY OF CERTAIN DATA/DOCUMENTS PURSUANT TO D.17-09-023**

I, Karen L. Sedgwick, do declare as follows:

1. I am the Vice President & Treasurer for Sempra Energy, parent company of San Diego Gas & Electric Company ("SDG&E") and Southern California Gas Company ("SoCalGas" or "SCG"). I have reviewed the Cost of Capital ("COC") Application of San Diego Gas & Electric Company and the accompanying testimony. I am personally familiar with the facts in this Declaration and, if called upon to testify, I could and would testify to the following based upon my personal knowledge and/or information and belief.

2. I hereby provide this Declaration in accordance with Decision ("D.") 17-09-023 to demonstrate that the confidential information ("Protected Information") provided in Section V.D and Exhibit SDG&E-Concentric-3 of the Wildfire Risk Premium prepared direct testimony of Concentric Energy Advisors, sponsored by witnesses John J. Reed and James M. Coyne (April 2019) (Exhibit SDG&E-05, Chapter 1), is within the scope of data protected as confidential under applicable law.

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3. In accordance with the legal citations and narrative justification described in Attachment A, attached hereto, the Protected Information should be protected from public disclosure.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct to the best of my knowledge.

Executed this 19th day of April 2019, at San Diego, California.

Karen L. Sedgwick
Vice President & Treasurer
Sempra Energy

# ATTACHMENT A

## SDG&E Requests Confidentiality for the following information in the Wildfire Risk Premium prepared direct testimony of Concentric Energy Advisors, sponsored by witnesses John J. Reed and James M. Coyne (April 2019) (Ex. SDG&E-05, Ch. 1)

| Location of Protected Information | Legal Citations | Narrative Justification |
|---|---|---|
| Section V.D and Exhibit SDG&E-Concentric-3 of the Wildfire Risk Premium prepared direct testimony of Concentric Energy Advisors, sponsored by witnesses John J. Reed and James M. Coyne (April 2019) (Ex. SDG&E-05, Ch. 1). | Gov't Code § 6254(k) ("Records, the disclosure of which is exempted or prohibited pursuant to federal or state law."). <br><br> Gov't Code § 6254.7(d) (Trade Secrets); Gov't Code § 6254.15 ("Nothing in this chapter shall be construed to require the disclosure of records that are any of the following: corporate financial records, corporate proprietary information including trade secrets . . ."); Evid. Code § 1060 (Trade Secrets); and Civil Code § 3426 *et seq.* (Trade Secrets). <br><br> D.11-01-036 at 5 (agreeing that confidential prices and contract terms specifically negotiated with a program vendor is proprietary and commercially sensitive and should remain confidential). | The Protected Information is entitled to confidential treatment under applicable law, including, but not limited to, the legal authority cited herein. Section V.D and Exhibit SDG&E-Concentric-3 of the Wildfire Risk Premium prepared direct testimony of Concentric Energy Advisors, sponsored by witnesses John J. Reed and James M. Coyne (April 2019) (Ex. SDG&E-05, Ch. 1), contains confidential information regarding annual insurance premiums and average Rate on Line percentages. This information is non-public financial information that is proprietary, commercially sensitive, and contains trade secrets. In addition, public disclosure could place SDG&E at a competitive disadvantage, resulting in potential harm to SDG&E and ratepayers. |

Company: San Diego Gas & Electric Company (U 902 M)
Proceeding: 2020 Cost of Capital
Application: A.19-04-XXX
Exhibit No.: SDG&E-05 Chapter 2

# SAN DIEGO GAS & ELECTRIC COMPANY
# PREPARED DIRECT TESTIMONY OF TODD A. SHIPMAN, CFA
# CHAPTER 2

## BEFORE THE PUBLIC UTILITIES COMMISSION
## OF THE STATE OF CALIFORNIA


**APRIL 2019**

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EXHIBITS

## I. INTRODUCTION AND QUALIFICATIONS

**Q. Please state your name and business address.**

A. My name is Todd A. Shipman. I am an Executive Advisor with Concentric Energy Advisors, Inc. ("Concentric"), which has its headquarters at 293 Boston Post Road West, Suite 500, Marlborough, Massachusetts 01752.

**Q. On whose behalf are you submitting this testimony?**

A. I am submitting this testimony on behalf of San Diego Gas and Electric Company ("SDG&E" or the "Company"), a subsidiary of Sempra Energy, Inc. ("Sempra"), a publicly-traded holding company.

**Q. Please summarize your education and business experience.**

A. I graduated from Texas Christian University with a Bachelor of Business Administration ("B.B.A.") degree with a major in economics, and from Texas Tech University School of Law with a Juris Doctor ("J.D.") degree. I was awarded the Chartered Financial Analyst ("C.F.A.") designation in 1989. I have over 33 years of experience in the financial and utility industries. I began in the financial industry as an analyst with a research firm that specialized in analyzing and reporting the investment implications of the actions and behavior of utility regulators. Subscribers to the research included investment bankers and analysts at major Wall Street firms, large institutional investors such as insurance companies and mutual funds, utilities, and regulators.

I then joined an independent power producer. My primary responsibility was in regulatory affairs. I coordinated and managed its interventions in state regulatory proceedings. I also assisted in its development efforts, analyzing avoided-cost rates and regulatory policies toward non-utility power production, and in its investor relations.

I spent the last 21 years of my career at S&P Global Ratings ("S&P"), a major ratings agency that has been in business for over 150 years and issues more than one million ratings on over $ 46 trillion of debt across all global capital markets. I performed credit surveillance of utilities, pipelines, midstream energy, and diversified energy companies. In the final approximately ten years at S&P, I was the Sector Specialist on the United States ("U.S.") and, later, North American utilities team. In that role I was the lead analyst on the team, charged with ensuring ratings quality, assisting in the training and development of new analysts, and creating the criteria used to establish ratings on utilities. I also led outreach efforts to investors and the regulatory community and performed a lead analytical role in the development and application of global ratings criteria for hybrid capital securities.

**Q. Please describe the responsibilities of your current position.**

A. After retiring from S&P last year, I became a management consultant specializing in advising utilities and other entities on credit and ratings issues, balance sheet management, and capital markets strategies. I joined Concentric in August 2018 as an Executive Advisor. My resume is provided as Exhibit SDG&E-TAS-1, attached hereto.

**Q. What is the purpose of your testimony?**

A. The purpose of my prepared direct testimony is to explain the importance of credit ratings to investor-owned utilities, how regulatory risk affects the credit analysis of utilities, and the effect on utility credit quality of the legal doctrine of inverse condemnation and how it has been applied in California. I express my opinion on how SDG&E's cost of capital filing can help support credit metric restoration.

**Q. Are you sponsoring any exhibits that accompany your testimony?**

A. Yes, I am sponsoring the following exhibits, attached hereto:

- Exhibit SDG&E-TAS-1 is my resume;
- Exhibit SDG&E-TAS-2 is the ratings scales of Moody's Investor Service ("Moody's") and S&P; and
- SDG&E-TAS-3 depicts the S&P ratings methodology for all corporate issuers.

**Q. How is the remainder of your testimony organized?**

A. Following this introduction, Section II is an executive summary of my testimony and key conclusions. In Section III, I discuss the credit ratings and the key factors which influence a company's credit rating as established by the credit rating agencies. In Section IV, I discuss the ratings actions already taken and possible future actions arising from the deterioration in utility credit quality in California. Section V addresses the cost of capital implications of ratings downgrades. Finally, Section VI summarizes my conclusions.

## II. EXECUTIVE SUMMARY

**Q. Please summarize your testimony.**

A. Credit ratings are an influential and reliable measure of a company's risk that are used by investors and other interested parties to assist in assessing risk. Ratings are derived by an analysis of an issuer's business risk, a qualitative exercise, and its financial risk, a quantitative exercise. For utilities, regulatory risk is a major component of the analysis. The actions of regulators exert significant influence on a utility's ratings by affecting both sides of the ratings equation. The recognition of growing risks surrounding the severe wildfires that have occurred in California in recent years and the regulatory response to the developments have resulted in numerous ratings downgrades. Reversing

the credit quality deterioration and restoring ratings to previous levels would require an improvement in financial risk that implies an equity return premium within the wildfire risk premium in the range of 1.87 to 6.50 percent range, as recommended John Reed and Jim Coyne (Ex. SDG&E-05, Chapter 1).[1]

## III. CREDIT RATINGS

**Q. What is a credit rating?**

A. A credit rating is an opinion of an entity's or a security's credit risk, which can be summarized as the ability and willingness of an issuer to fulfill its financial obligations in full and on time. Credit risk essentially refers to the risk of default. Ratings address the relative probability that an issuer or an issue will experience default, *i.e.,* the failure to pay either the required periodic payment or the principal when it matures under the terms of the security. For some issues, a recovery rating is also published as a gauge of the possible loss that an investor would experience if default occurs, but that kind of rating is not generally a big factor for utilities.

**Q. What is a credit rating agency?**

A. The Securities and Exchange Commission ("SEC") defines a credit rating agency as an organization that provides an assessment of the creditworthiness of a company or a financial instrument. The SEC has acknowledged ten agencies as a nationally recognized statistical rating organization ("NRSRO"). But in practice there are three major rating agencies in the United States. Moody's and Standard & Poor's ("S&P") are the two major rating agencies that produce ratings on virtually all utilities. Fitch Ratings

[1] *See* the Prepared Direct Testimony of John J. Reed and James M. Coyne, Wildfire Risk Premium – Chapter 1 (April 2019) ("Ex. SDG&E-05, Ch.1 (Reed/Coyne)") at 6.

produces ratings for a limited number of utilities and occupies the only significant other proportion of ratings on corporate issuers in the U.S. All three issue ratings on SDG&E.

The primary activity of a rating agency is to issue ratings to facilitate the issuer's access to fixed income capital markets at the most efficient cost. The vast majority of fixed income securities are debt instruments. The agencies also publish analyses of the issuers and issuances to explain the ratings to the capital markets. Ratings are expressed in a series of letters, numbers, and/or symbols to summarize the relative creditworthiness of the entity or issue. The highest rating, denoting the lowest risk to investors, starts at AAA/Aaa and proceeds downward through the rating scale in both the English alphabet and the number of letters, until the rating of "D," or default, is reached. Within most rating categories, a symbol (+ or minus) or a number (1, 2, 3) is appended to describe the rating's relative position in the category. The ratings scales of the two major rating agencies appear in Exhibit SDG&E-TAS-2.

Ratings in the BBB/Baa category and above are considered "investment-grade" by market participants. Ratings below BBB-/Baa3 are known as "speculative-grade;" colloquially "junk," securities. Because some investors are precluded from holding speculative-grade issues, the difference between investment-grade and speculative-grade ratings is profound and is recognized by rating agencies and market participants.

In addition to communicating credit opinions through the letter ratings, the agencies also publish their views on the prospect for future ratings changes, either positive, neutral, or negative. When this is expressed as an "outlook," it is a relatively mild indication that ratings could change over an extended period. When ratings are

"placed on review" (Moody's) or on "CreditWatch" (S&P), the positive or negative stance is indicative of a more likely ratings change that could happen in the near term.

**Q. Do credit ratings provide a useful measure of a company's risk?**

A. Yes. The default experience of issuers validates the usefulness of credit ratings as a measure of risk in general and the distinction between investment-grade and speculative-grade ratings in particular. According to Moody's, in the 1994 through 2018 time period the five-year average, volume-weighted corporate bond default rate increases from one rating category to the next lower one in the ratings scale, from a low of 0.43% for the Aaa category to 33.64% for the combined "Caa-C" categories. For the investment-grade categories, the rate never gets to 1%. It increases to over 4% – almost five times as high – in the first speculative-grade category.[2]

**Q. Who uses credit ratings?**

A. Ratings are primarily aimed at fixed-income investors. Investors use credit ratings to assist their investment decisions: which companies to invest in; the price (yield) that they will charge to lend a company money; and the stability of the issuer over time. The answers to those questions will depend on many factors. But ratings are important to fixed-income investors because they represent an independent, third-party opinion that is based on a consistent approach to assessing risk across time, security types, industries, and other considerations that inform investment decisions. Investors look at more than the current ratings. Ratings also offer valuable insight into the performance of a company over time in terms of investment risk in the past and in the future. Some institutional investors are restricted from holding securities rated below a certain level

[2] Moody's Investors Service, Annual Default Study: Defaults will rise modestly in 2019 amid higher volatility (February 1, 2019) at 44, Exhibit 52.

and seek to avoid investing in volatile securities because forced sales disrupt return objectives and can be costly. This is especially relevant in the rating categories close to the investment-grade/speculative-grade divide.

**Q. How are credit ratings established?**

A. Ratings are established by a committee of analysts within a given credit rating agency that specialize in the industry or industries of the rated entity. The credit analysis is prepared by a primary analyst, sometimes with the assistance of a secondary analyst and other analysts and presented to the committee. If the credit analysis is inordinately complex, other analysts will be brought into the analysis and committee to offer expertise and perspective.

**Q. What specific analysis is performed by the analysts to establish a credit rating?**

A. The analysis itself is a multi-faceted exercise that focuses on two main areas that can be described generally as quantitative and qualitative in nature. The quantitative side of the analysis examines financial ratios and other metrics to analyze the financial risk of the issuer. The qualitative side of the assessment examines business risk, which is built up from the broad risks at the macro level such as country risk and industry risk. Then the issuer's more specific risk within its business and economic environment is determined. For a utility, the major risks are regulatory risk, operating risk, and cash-flow diversity.

Credit analysis is basically an exercise that measures those two aspects of the risk profile of an entity. Business risk and financial risk add up to the total credit risk. Thus, they can be viewed as opposing sides of the total risk of an entity, so that more of one must be offset by less of the other to arrive at a particular rating. Because utilities are tightly regulated on financial matters that limit how much financial metrics can differ

over time, it is often the qualitative analysis that drives changes in ratings. That especially holds for investment-grade companies, which is where most U.S. utilities sit in the ratings spectrum, because the qualitative analysis is slightly predominate over the financial analysis when the two are combined to reach a rating outcome.

**Q. Please describe credit metrics and the financial risk considerations that make up the quantitative side of credit analysis.**

A. Credit analysis is distinguished from other kinds of financial analyses performed in the financial sector by its emphasis on cash flow. Equity analysts focus almost solely on earnings-based metrics that drive stock prices. Recognizing that servicing debt requires not just earnings but actual cash, credit analysts strive to understand the cash-flow dynamics of a company's financial results as much or more than the bottom-line earnings. The primary measure that rating agencies use as a base for most cash-flow metrics is cash flow from operations ("CFO") or some derivation of it. For utilities, changes in regulatory assets and liabilities add a unique layer of cash-flow differences. Working off CFO, both Moody's and S&P remove working capital changes from the metric (the short-term ebb and flow of cash that does not reveal any information on the fundamental ability of the company to produce cash from its operations) to find the basic cash-flow measure they use to gauge financial risk. Alternatively called funds from operations ("FFO") or CFO Before Changes In Working Capital ("CFO pre-WC"), this represents the utility's essential ability to generate cash from its day-to-day operations. The more reliably an issuer can generate the cash needed to pay interest and any other fixed-income demands, the lower the credit risk and the higher the rating.

The other major element of financial risk is the total amount of debt or debt-like obligations embedded in the issuer's balance sheet and other activities. Total debt

comprises long-term and short-term debt on the balance sheet. It may be adjusted for other items that the rating agency regards as debt-like or for surplus cash that it considers to be nettable against the debt amount. Examples of the former are lease liabilities, long-term power purchase obligations, and deferred taxes.

Credit metrics incorporate some combination of cash flow and total obligations to compare the ability to generate cash to the burden of servicing the obligations during a specified period. The metrics are calculated for both historical periods and future forecasts and fall into two basic types: leverage and coverage ratios. Leverage metrics attempt to assess the relative burden of debt and other fixed-income obligations compared to the financial responsibility being carried by shareholders. Coverage metrics are something of the opposite, gauging the more immediate question of how cash flow compares to the need to service the fixed-income obligations in a stated timeframe.

**Q. Please describe business risk considerations that make up the qualitative side of credit analysis.**

A. Evaluating business risk for utilities is overwhelmingly a matter of regulatory risk. Although the agencies describe this risk factor as "regulatory," it encompasses legislative and judicial matters as well as the activities of regulatory bodies. Even for areas that do not explicitly touch on regulatory behavior they almost invariably circle back to the central question of utility regulation – cost recovery, including full recovery of a utility's cost of capital through a reasonable authorized return on equity. The nature and pace of the process of recognizing an incurred cost for recovery through rates is the paramount business risk concern of a utility credit analyst. Even the other factors tied to regulatory risk, such as the political influences on regulation, are addressed only to illuminate the

risk surrounding the ultimate factor of covering all costs sufficiently to earn a reasonable return on investment.

For Moody's, regulatory risk constitutes over 80% of the business risk component of the analysis and 50% of its entire credit analysis. For S&P, it is 60% of the business risk analysis and approximately 40% of its total credit analysis. Regulatory risk is thus nearly the sole criterion of business risk. For instance, Moody's assesses diversity in its analysis, but regulatory diversity is one of the main sub-factors therein. S&P scores operating efficiency as part of its business risk profile. But since utilities recover costs in rates, operating skill and cost control are of interest primarily as a function of how they affect the regulator's attitude toward the utility's ability to achieve reliable service quality at reasonable rates.

Moody's and S&P's approaches to analyzing regulatory risk are similar. Both focus on the basic regulatory framework, including the legal foundation – both legislative and judicial – for utility regulation, the history of regulatory behavior, and the ratemaking policies and procedures that determine how well the utility is afforded the opportunity to earn a reasonable return with a reasonable cash component. Overlaying all of that is the agency's view of the utility's ability to manage regulatory risk. As with any other kind of risk that a creditor is faced with, they look to the utility to correctly identify, analyze, and manage regulatory risk with an eye toward minimizing it. Thus, the regulatory environment, which encompasses the legislative, judicial, and regulatory bodies, forms the initial basis for the analysis of regulatory risk but does not constrain it.

Another fundamental principle of evaluating regulatory risk is the high value placed on consistency and transparency. Rating agencies rate many types and tenors of

fixed income securities. But the quintessential instrument that drives the analysis is long-term debt. They regard debtholders who extend credit over long periods as their primary "client" and strive to rate long-term debt as accurately as possible over the longest timeframe as possible. Utilities fund capital expenditures with long-dated maturities to match the life of the assets. Utility investors value ratings that are forward-looking and stable. Because the predictability offers creditors the ability to accurately assess risk over the same time that the debt is outstanding and improves the ability of the company to manage its business activities and capital program, regulatory frameworks and practices that allow rating agencies to confidently project future cash flows and the volatility of those cash flows will naturally be accorded a better business risk profile.

Finally, rating agencies examine the mechanics of regulation, particularly the rate-setting process. Rate cases take up much of the analysis. But the totality of a utility's tariff schedule is assessed to capture the effect on business risk of revenues generated outside base rates. Creditors – and therefore rating agencies – view favorably tariff provisions that operate outside the rate case cycle and adjust rates automatically to match revenues with expenses, thereby avoiding regulatory lag. Fuel clauses and increasingly other varieties of riders are almost universal across the utility industry. These are the most common of these kinds of rate mechanisms that stabilize earnings and cash flows to the benefit of the business risk profile.

**Q. How can regulation influence credit ratings?**

A. Regulators act on both sides of the credit rating equation. The manner of establishing rates and the level and timing of cost recovery has a direct effect on a utility's ability to earn its authorized return on equity ("ROE") and produce enough earnings and cash flow

to support its ratings. Further, the same regulatory actions that affect a utility's ability to earn its authorized ROE also have a knock-on effect on business risk, magnifying the ratings impact of regulatory decisions and behavior that fall outside expectations or norms.

**Q. How do credit ratings and actions affect a utility and its customers?**

A. The most straightforward effect is on a utility's cost of capital. Fixed-income investors consult ratings to assist them in determining the "price" they will charge the utility for the use of their money. The total price is the combination of the interest rate of the instrument and its initial value in relation to the stated amount on the instrument. There is generally an inverse relationship between debt cost and ratings: the higher the rating, the lower the cost. Equity investors, *i.e.,* stockholders, also use credit ratings as a risk guide to help them decide the terms on which they will offer their capital to a utility. The more risk they detect, the greater return they will seek to compensate them for bearing that risk. The effect is not as direct or precisely quantifiable as it is with fixed-income instruments. But in my experience equity investors often take notice of, and react to, credit ratings.

## IV. WILDFIRE RISK AND ITS EFFECT ON CREDIT QUALITY

**Q. Given the basic outline of credit ratings, credit analysis, and the rating process you just enunciated, how does the current uncertainty surrounding the risk of wildfires and their costs affect the ratings of California utilities?**

A. The risks associated with the legal doctrine of inverse condemnation and how it has been applied divergently to wildfires in California by state courts and the California Public Utilities Commission ("CPUC" or "Commission") has resulted in numerous ratings downgrades of utilities in the state and has the potential to further erode credit quality. The risk attaches to both sides of the credit analysis equation. But it most directly and

urgently affects the business risk of California electric utilities through the perception that the regulatory environment in the state has worsened and threatens the regulatory compact. It has already increased regulatory risk for those utilities.

**Q. How has the development of inverse condemnation and the CPUC's reaction to it in recent years increased utility business risk?**

A. As more intense and costly wildfires in the state have proliferated, the costs the utilities have been forced to bear under the strict liability standard construed by the courts have begun to exceed their insurance coverage. This has brought the risk more in focus. Pacific Gas and Electric Company's ("PG&E") bankruptcy filing this past January has further intensified the recognition of the risk by investors and the rating agencies. The first indication of the heightened risk environment was the CPUC's decision for SDG&E to deny recovery of the costs incurred from its 2007 wildfires in excess of insurance and other proceeds. The disconnect between the strict liability imposed by the courts and the ordinary prudence standard applied by the CPUC in that case that did not take strict liability into account brought the rising risk to the attention of the rating agencies. It signaled the rising risk that utilities may not be able to fully recover wildfire liability costs.

**Q. Why did the rating agencies not react negatively to that CPUC decision?**

A. The prevailing opinion at the time was that the California legislature would respond to the situation with a resolution of the problem of costs being trapped by the divergent standards of review. For instance, in a concurrence, CPUC President Picker and Commissioner Guzman-Aceves called for the legislature and the courts to reconsider the issue and was viewed as a reasonable path forward that would preserve the low regulatory risk that the rating agencies perceived for California utilities. To the present

day, I believe the market reaction and rating agency actions for SDG&E and other investor-owned utilities continue to be constrained by the expectation that the legislature will address inverse condemnation and wildfire cost recovery to contain the risk.

**Q. How does the wildfire cost recovery risk get reflected in the credit analysis of California as it materializes?**

A. The most immediate and direct impact is when a utility experiences a major wildfire and its ignition implicates the utility's equipment. In the current state of the development of inverse condemnation and cost recovery standards, the potential for substantial non-recovery of the costs is high and has near-term financial and liquidity effects that can weaken the utility's financial risk. The prospect of less than full recovery also negatively affects the utility's business risk by highlighting the eroding regulatory environment that forms the foundation of all utility ratings. The effect on ratings is essentially doubled, in a sense, as both sides of the credit analysis degrade. For a utility that is exposed to wildfire risk in general but is not experiencing any actual costs from a major wildfire, the primary effect is on the business risk profile.

**Q. Is there an example of the former?**

A. Yes, as discussed in Don Widjaja's testimony, two California utilities are presently exposed to major wildfire costs.[3] The downward progression of the PG&E ratings, which now stand at "D," or were "D" before being withdrawn, illustrates the exponential nature of the credit deterioration in the face of significant wildfire costs in the current California regulatory environment. Ratings of Southern California Edison Company ("SCE") have

[3] *See* Prepared Direct Testimony of Don Widjaja, Company Risk (April 2019) ("Ex. SDG&E-03 (Widjaja)") at 6-8.

also begun to reflect the greater impact of the combination of weakening regulatory risk and a direct effect of possible under-recovery of major wildfire costs on financial risk.

**Q. Is there an example of a utility that is not presently subject to major wildfire costs?**

A. SDG&E does not have major, outstanding wildfire liabilities, but serves as an example of the overall worsening regulatory risk and its effect on ratings.

**Q. What happened to PG&E ratings preceding the bankruptcy filing?**

A. As described in Mr. Widjaja's testimony, after extensive wildfires in October 2017 and the parent company's decision shortly thereafter to suspend its common and preferred stock dividends, Moody's placed PG&E on review for possible downgrade. Moody's did so because the dividend suspension, which would normally be viewed positively by creditors as the retained cash and earnings improved liquidity and the balance sheet, was taken as a signal that exposure to wildfire cost under-recovery was significant.

S&P acted similarly, which in their system is to put a company on CreditWatch with negative implications. By February 2018, S&P had downgraded PG&E to 'BBB+,' putting it out of the 'A' category. Moody's followed suit in March by downgrading the utility to its lowest rating in the 'A' category based on concerns that recovery of the wildfire costs was subject to considerable uncertainty. In June, S&P lowered ratings another notch to 'BBB' as the magnitude of the 2017 wildfire costs was becoming more clear. Business risk assessments still had not changed, although a slight weakening in both that and the utility's financial risk was noted. Moody's dropped PG&E out of the 'A' category in September 2018 to 'Baa1,' the equivalent rating to S&P's, after the results of the California legislative session apparently fell short of its expectations with the enactment of Senate Bill ("SB") 901.

In November 2018, both agencies lowered PG&E ratings another notch as new major wildfires exerted more pressure on the utility's financial strength. Ratings actions were now also based on the determination that regulatory risk was rising, denting the business risk of PG&E. Those investment-grade ratings were moved dramatically into sub-investment grade categories by both agencies in January 2019 as the looming liabilities for the collective wildfires became more evident, and, significantly, the business risk tied to the regulatory and political environment in California continued to deteriorate. Ratings swiftly moved lower into some of the lowest rating categories ('Caa' and 'CC' for Moody's and S&P respectively) within a week as PG&E telegraphed its intention to file for protection from its creditors under Chapter 11 of the U.S. Bankruptcy Code.

**Q. What has happened to the ratings of SCE as the awareness of rising wildfire risk has unfolded?**

A. After first lowering SCE's rating to 'A3' in September 2018, Moody's took action again after the January news that PG&E was filing for bankruptcy. Moody's placed the company's rating on review for possible downgrade, and then downgraded SCE two notches to 'Baa2' later in March 2019. Downgrades in the investment-grade space are not usually more than one notch because of the greater stability for investment-grade companies, so the multi-notch downgrade is notable.

S&P almost immediately downgraded SCE in the aftermath of the announced PG&E filing, to the middle of the 'BBB' range, and placed ratings on CreditWatch with negative implications. The downgrade, just one notch, was effectuated through a downward reassessment of the company's regulatory and business risk regulatory construct, and they cited a continued reevaluation of the California regulatory construct

in its CreditWatch placement. Moody's rating action was more explicitly based on their projections of weakening financial metrics due to SCE's exposure to multi-billion-dollar wildfire costs. They said that further downgrades would result if the regulatory environment fails to improve through greater certainty on wildfire cost recovery.

**Q. What has happened to the ratings of SDG&E as the awareness of rising wildfire risk has unfolded?**

A. SDG&E was also downgraded, despite the absence of major wildfires in its service territory in 2017-2018. As described in the testimonies of Bruce MacNeil and Mr. Widjaja,[4] Moody's initiated a negative outlook on SDG&E in April 2018 and acted on that negative stance in September 2018 in the wake of the passage of SB 901. That rating action, which left the Company on a stable outlook, was probably more a function of the very high ratings at SDG&E that Moody's thought was incompatible with the uncertainties surrounding inverse condemnation and wildfire cost recovery. Similarly, S&P instituted a negative outlook in July 2018 that led to downgrade in September 2018 that was one equivalent notch lower than Moody's but still in the 'A' category at 'A-.' S&P stated its downgrade reflected the unaddressed longer-term risks associated with inverse condemnation.[5]

In January 2019, S&P instituted another one-notch downgrade to BBB+ that dropped SDG&E out of the 'A' category with a negative outlook, for the reasons outlined in Mr. Widjaja's testimony.[6] On March 5, 2019, Moody's instituted a similar two-notch downgrade to Baa1 out of the 'A' rating category. The ratings agency said that the

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4 Prepared Direct Testimony of Bruce MacNeil, CCM and Rating Agencies (April 2019) ("Ex. SDG&E-06 (MacNeil)") at 10; Ex. SDG&E-03 (Widaja) at 12-15.

5 *See* S&P Global Ratings, San Diego Gas & Electric Co. Downgraded To 'A-' on Unaddressed Longer-Term Wildfire Risks; Outlook Negative (September 5, 2018).

6 *See* Ex. SDG&E-03 (Widjaja) at 12-14.

downgrade reflected the company's exposure to sizeable potential liabilities in connection with California wildfires, resulting in higher business and financial risks profile compared to utilities operating outside of California.[7]

Table 1 below summarizes the ratings actions of S&P and Moody's on the California utilities since 2017.

**Table 1: Timeline of Credit Rating Actions**

| | PG&E/ Moody's | PG&E/ S&P | SCE/ Moody's | SCE/ S&P | SDG&E/ Moody's | SDG&E /S&P |
|---|---|---|---|---|---|---|
| As of YE 2017 | A2 | A- | A2 | BBB+ | A1 | A |
| February 2018 | | BBB+ | | | | |
| March 2018 | A3 | | | | | |
| June 2018 | | BBB | | | | |
| September 2018 | Baa1 | | A3 | | A2 | A- |
| November 2018 | Baa2 | BBB- | | | | |
| January 2019 | Ba3, then Caa3, then D | B, then CC, then D | | BBB | | BBB+ |
| March 2019 | | | Baa2 | | Baa1 | |

**Q. What do you conclude from the declining ratings and the possibility of more ratings downgrades of California utilities based on the actions of Moody's and S&P so far?**

A. The first point to take away from the agencies' behavior thus far is that, as the ratings agencies have repeatedly stated, the overall regulatory risk in California is the main reason for the rating actions. Rating agency downgrades and negative stances on electric utility ratings have been based mostly on the deterioration in the business risk profile of the utilities in question, which, as explained above, is driven almost solely by views of regulatory risk. As S&P stressed, it found "SDG&E's . . . operational management of

[7] *Id*. at 15-16.

wildfire mitigation . . . as exceptional compared to peers,"[8] but nonetheless downgraded the Company's credit rating because "[w]e believe that all California electric utilities are susceptible to potential liabilities from wildfires."[9]

The second point is that the ratings agencies have indicated that further downgrades could occur. S&P stated that it could further lower its ratings on SDG&E by one or two more notches if "concrete steps" are not taken to address growing wildfire liability risks before the start of the 2019 wildfire season.[10] Moody's has echoed those concerns.

I note that rating agencies and investors are not unfamiliar with the risks that natural disasters impose on utilities. In the case of Hurricane Katrina, the result was the bankruptcy filing of Entergy New Orleans, and the agencies have often cited hurricane risk when assessing the credit quality of utilities prone to those storms in places like Florida. But S&P has contrasted California's regulatory framework for catastrophic wildfire with Florida's handling of hurricanes. Florida has allowed for the securitization of those costs and utilities can petition for the recovery of storm costs for natural disasters without being subject to an earnings test.[11]

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8 *See* S&P Global Ratings, San Diego Gas & Electric Co. Downgraded To 'A-' on Unaddressed Longer-Term Wildfire Risks; Outlook Negative (September 5, 2018) at 3.

9 S&P Global Ratings, Credit FAQ: Will California Still Have an Investment-Grade Investor-Owned Electric Utility? (February 19, 2019), *available at* https://www.capitaliq.com/CIQDotNet/CreditResearch/RenderArticle.aspx?articleId=2168627&SctArtId=467165&from=CM&nsl_code=LIME&sourceObjectId=10866063&sourceRevId=14&fee_ind=N&exp_date=20290218-21:25:39.

10 *Id*.

11 *Id*.

## V. RESTORING CREDIT QUALITY IF WILDFIRE RISK IS NOT FULLY MITIGATED

**Q. How would further agency rating downgrades affect SDG&E and its ratepayers?**

A. Further downgrades into the lower reaches of investment-grade ratings would allow the utility to continue to provide reliable service, but the cost of both debt and equity would rise in response to the higher risk. Also, inhabiting the space barely in the lowest investment-grade category would leave SDG&E vulnerable to disruptions such as economic and financial market crises. This is likely why the Commission has historically targeted ratings deeper into the investment-grade ratings spectrum.[12] For instance, short-term ratings associated with that level of credit quality make access to the low-cost commercial paper market more tenuous.

Utilities that fall into speculative grade are much costlier in terms of capital costs and liquidity. Very few U.S. utilities occupy these ratings strata. Those that do are usually there only temporarily due to unusual circumstances that are later resolved. To be consigned below investment grade ratings because of an inherent weakness in the regulatory environment that will subsist for an extended period would be unprecedented, in my view, and would expose SDG&E and other utilities in California to uncharted financial and operating challenges. Speculative-grade credit quality precludes some institutional investors from holding an issuer's debt securities, which magnifies the cost of capital effects by limiting the potential pool of investors. Operationally, trade creditors and other counterparties often demand different terms for conducting business

[12] *See* Decision ("D.") 12-12-034 at 37 (maintaining that investment-grade creditworthiness is an "important component[] of the *Hope* and *Bluefield* decisions) (alteration in original); *see also* D.03-12-035 at 42 ("the cost of investment grade debt is considerably less . . . the lower cost of a utility's debt translates into lower rates, all else being equal.").

with a company that is not investment-grade. This raises the cost and availability of liquidity and working capital. For example, purchase power agreement ("PPA") counterparties are likely to demand higher power prices to compensate for a lower-rated purchaser that imposes higher financing costs on the power project owner.

**Q. How can ratings be restored in the face of ongoing wildfire risk exposure for SDG&E?**

A. As described above, the ratings actions to date and the primary consequence of the proliferation of wildfire liability risk has been the changing perception of regulatory risk in California. As noted, credit analysis principles tell us that credit risk is primarily the product of two intersecting types of risk, business and financial. The roadmap to how those two factors interact, as well as how ancillary considerations factor into the analysis, is provided by the rating agency criteria and methodologies. While ratings are not solely a matter of assigning and changing scores, as I explained at the beginning of this testimony, the agency methodologies are a useful tool in discerning to what extent stronger financial performance can ameliorate the effect of wildfire liability risk. In this regard, I think the S&P methodology is the most transparent and user-friendly, so I will employ it to show a path toward the 'A' ratings that SDG&E once held.

**Q. Why should the 'A' category be targeted for SDG&E?**

A. As noted, the CPUC has historically supported a utility's efforts to achieve and maintain ratings in the 'A' category.[13] As the testimony of Dr. Roger Morin states, a single A-rating for a utility results in the lowest cost of capital.[14] Dr. Morin demonstrates that the difference in costs between being a single A-rated and BBB-rated company is 50

[13] *See* D.12-12-034 at 35; D.03-12-035 at 42.

[14] Prepared Direct Testimony of Roger A. Morin, Ph.D., Return on Equity (April 2019) ("Ex. SDG&E-04 (Morin)") at 63-64.

basis points.[15] That means, for every $100 million of bonds issued by a utility, the cost to ratepayers of being BBB instead of A-rated is $10 million.[16] Additionally, those investors that are unable to participate in a speculative-grade utility's debt offerings may be reticent about jumping back in if an issuer on the cusp is still susceptible to dipping back below the divide. Robust and steady access to all investors is key to managing the cost of capital.

**Q. How does the S&P methodology for utilities produce a rating?**

A. Referring to Exhibit TAS-3, attached hereto, which is a pictorial depiction of the analysis, I work from the upper right to the bottom of the chart to proceed through the analysis and identify those focus points that can be used to understand SDG&E's credit ratings and how to achieve the targeted upgrades. The analysis begins at the broad country and industry level, which are not areas that can be altered here. The analysis next turns to the issuer, where the "competitive position" is derived from its business risk profile. When combined with the quantitively-based financial risk profile, it produces an "anchor score" that forms the foundation for the basic rating profile of the issuer. Various modifiers can affect that score, including the commonly used and all-encompassing comparable ratings adjustment ("CRA") modifier. Finally, the influence that a company's ownership exerts on credit quality is incorporated into the analysis when it is part of a larger corporate family.

[15] *Id.* at 64.
[16] *Id*.

**Q. What is SDG&E's current credit profile according to the S&P methodology?**

A. With the recent downgrade, SDG&E's business risk profile is assessed as "Strong," and its financial risk profile as "Significant." Those two scores result in an anchor score of 'bbb' (anchor scores are expressed in lower-case categories that correspond to the capitalized ratings scale). One modifier, the CRA, is employed to raise the stand-alone credit profile ("SACP") to 'bbb+'. The result is a basic rating, called by S&P an issuer credit rating ("ICR"), of 'BBB+.'[17] The overall Sempra credit profile is at the same level as SDG&E's rating, so it does not alter the utility's ratings.

**Q. What is the requisite improvement in SDG&E's credit metrics necessary to be credit supportive?**

A. As noted, a credit ratings assessment involves both a quantitative and qualitative assessment of business and financial risks. In other words, it is art as well as science. Nevertheless, there are certain means by which SDG&E can quantitatively lower its financial risk to be credit supportive. In my opinion, wildfire risk has impaired SDG&E's business risk profile to an extent that a meaningful improvement in the financial risk profile would be required to restore ratings at or close to their former position in the "A" category. Financial metrics that support a solid position well within the next highest financial risk assessment – called "Intermediate" in the S&P lexicon – would support the ratings objective.

S&P looks at many credit metrics in the cash flow/leverage analysis that it bases the financial risk profile on. It communicates primarily through reference to what is called its "core" ratio of FFO-to-debt. That payback ratio, a measure of leverage, is the

[17] S&P Global Ratings, San Diego Gas & Electric Co. Downgraded to 'BBB+', Outlook Remains Negative (January 21, 2019) at 3.

most prominent marker of financial risk cited by S&P, so I will use that as a gauge for the degree of financial improvement that I believe would be necessary for SDG&E to begin to restore its credit quality to the benefit of ratepayers. According to S&P, SDG&E's calendar-year 2018 adjusted FFO-to-debt was 19.84%. The metric has averaged about 23% over the past three years. Using the financial benchmarks S&P applies to most utilities, including SDG&E, the midpoint of the FFO-to-debt range of 23%-to-35% in S&P's methodology is 29%. I believe getting above that midpoint would support improved credit ratings, so targeting above the mid-point to about 30% to 32% FFO-to-debt is a prudent course to take.

**Q. What does that imply in terms of SDG&E's profitability and returns?**

A. Raising the FFO-to-debt metric 100 basis points above the last-achieved figure – or 70 basis points above the recent average – would imply much greater returns if profitability alone was the sole tool to execute the improvement. Turning again to S&P's published figures, SDG&E's FFO has averaged $1.39 billion. Net income has averaged roughly $550 million over the preceding three-years, with an average debt level of about $6.1 billion.

To reach a targeted metric result of 30%, SDG&E's would have to average about $1.8 billion in FFO, and around $720 million in net income, if its average contribution to FFO held steady over that time. As such, about a 300+ extra basis point return would be minimally necessary to start to achieve the ratings objectives laid out above. A more robust target that would better support restoring SDG&'s ratings is a metric midway between the midpoint and the top of the range – 32%. This implies a 400+ basis-point improvement.

**Q. Is that the only way the CPUC could support the restoration of ratings?**

A. No. As a practical matter, reinstating ratings to a more solid investment-grade level and eventually restoring them in the mid-"A" category will require sustained effort over a long-time frame and include more tools than only higher equity returns. Stronger balance sheets and ratesetting protocols that enhance profitability, cash flow, and cash-flow stability could also be part of a regulatory toolkit needed to address the goal. The Company will have to do its part to use the tools the CPUC can offer to follow through and affect the changes needed to restore credit quality. I singled out the issue of equity returns to highlight the magnitude of the task and quantify part of the costs that unmitigated wildfire risks have imposed on utilities and ratepayers.

## VI. CONCLUSIONS

**Q. Please summarize your key conclusions.**

A. As the Commission has recognized, strong investment-grade credit ratings should be targeted by the Commission to support SDG&E's ability to provide safe, reliable service at a reasonable cost to the benefit of its ratepayers. One way to support that goal is to authorize a return on equity that corresponds to SDG&E's cost of capital that includes a risk premium for heightened wildfire risk as recommended by Messrs. Reed and Coyne (Ex. SDG&E-05, Ch. 1 (Concentric)). Their recommended risk premium is consistent with that I estimate would be required to restore SDG&E's credit rating to a strong investment grade.

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

A. Yes. This concludes my prepared direct testimony.

## VII. STATEMENT OF QUALIFICATIONS

See Exhibit SDG&E-TAS-1 for a full statement of qualifications.

# Exhibit SDG&E-TAS-1
# Résumé of Todd Shipman

**Todd Shipman, CFA**
**Executive Advisor**

Mr. Shipman has over 30 years of experience in utility regulation, utility credit analysis, consulting, and capital market strategies. He is an expert witness and specializes in credit rating advisory and hybrid securities. Mr. Shipman's breadth of experience, which extends from financial analysis to regulatory intervention to capital markets, allows him to effectively advise on many areas within the energy industry.

Mr. Shipman is an adjunct faculty member at Boston University, where he teaches advanced undergraduate finance courses that cover capital markets, economic policy, and corporate finance.

**PROFESSIONAL HISTORY**

**Concentric Energy Advisors**
Executive Advisors 2018 - Present

**Boston University Boston, MA**
Lecturer January 2017 - Present

Adjunct faculty member in the Questrom School of Business, Department of Finance and Economics. Teach advanced undergraduate finance courses that cover capital markets, economic policy, and corporate finance.

**S&P Global Ratings New York, NY, and Boston, MA**
Senior Director April 2014 - May 2018
Director April 2000 - April 2014
Associate Director March 1997 - April 2000

Sector Specialist on the Global Infrastructure Ratings North American Utilities team. Performed credit surveillance of utilities, pipelines, midstream energy, and diversified energy companies. Chaired most team rating committees. Wrote credit reports and commentaries and led outreach efforts to investors and the regulatory community, including speeches and training seminars. Lead analytical role developing global rating criteria for utilities, master limited partnerships, and hybrid capital securities.

**Electric Utility Research Inc (defunct), San Francisco, CA**
Senior Vice President May 1996 - March 1997

Edited and contributed to an investor newsletter covering the electric utility industry.

**Sithe Energies Inc. New York, NY**
Manager, Regulatory Affairs November 1993 - May 1996

Managed state regulatory matters for a major independent power company. Coordinated interventions in regulatory proceedings. Assisted in identifying development opportunities. Participated in investor relations activities.

**Regulatory Research Associates Jersey City, NJ**
Vice President October 1993 - November 1993
Senior Analyst August 1989 - October 1993
Analyst August 1985 - August 1989

Analyzed and reported on actions by state regulators affecting the financial status of electric, gas, and telephone utilities for a firm that provided research to the Wall St. community. Contributed to the firm's sell-side research.

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**EDUCATION**

J.D., Texas Tech University School of Law, Lubbock, TX May 1984

B.B.A., Texas Christian University, Fort Worth, TX May 1981

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**PROFESSIONAL AFFILIATIONS & OTHER ACTIVITIES**

Chartered Financial Analyst
Wall Street Utility Group
Fixed Income Analysts Society Inc
Society of Utility and Regulatory Financial Analysts

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**OTHER ACTIVITIES**

President, Board of Directors, The Good Shepherd School, Charlestown, MA

# Exhibit SDG&E-TAS-2

# Ratings Scales

**EXHIBIT SDG&E-TAS-2**

**RATINGS SCALES**

| Characterization of debt and issuer (source: Moody's) | | Rating | |
|---|---|---|---|
| | | S&P | Moody's |
| Highest quality | Investment grade | AAA | Aaa |
| High quality | Investment grade | AA+ | Aa1 |
| | Investment grade | AA | Aa2 |
| | Investment grade | AA- | Aa3 |
| Strong payment capacity | Investment grade | A+ | A1 |
| | Investment grade | A | A2 |
| | Investment grade | A- | A3 |
| Adequate payment capacity | Investment grade | BBB+ | Baa1 |
| | Investment grade | BBB | Baa2 |
| | Investment grade | BBB- | Baa3 |
| Likely to fulfil obligations, ongoing uncertainty | Speculative grade | BB+ | Ba1 |
| | Speculative grade | BB | Ba2 |
| | Speculative grade | BB- | Ba3 |
| High credit risk | Speculative grade | B+ | B1 |
| | Speculative grade | B | B2 |
| | Speculative grade | B- | B3 |
| Very high credit risk | Speculative grade | CCC+ | Caa1 |
| | Speculative grade | CCC | Caa2 |
| | Speculative grade | CCC- | Caa3 |
| Near default with possibility of recovery | Speculative grade | CC | Ca |
| Default | | SD | C |
| | | D | |

# Exhibit SDG&E-TAS-3

# Issuer Credit Rating

## Issuer Credit Rating