



NARUC

National Association of Regulatory Utility Commissioners

The Interface between Utility Regulation and Financial Markets



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Introduction

The National Association of Regulatory Utility Commissioners (NARUC) is an organization made up of members of the state agencies that regulate utilities and other public service companies. These state public service commissions (PSCs) and public utility commissions (PUCs) most commonly regulate investor-owned utilities (IOUs) such as electric, natural gas, water, and other utilities providing public services as designated by state law.

The purpose of this paper is to review the interfaces between regulators and capital markets to explain the significance of financial market knowledge in public utility regulation. This topic is critical because IOUs finance their investments in utility infrastructure through debt and equity capital obtained from capital/financial markets.

Regulators (federal and state commissioners) throughout the history of public utility regulation and explicitly after US Supreme Court decision *Federal Power Commission et al. v. Hope Natural Gas* (see text box on page 4), have needed to estimate the cost of capital for a public utility and therefore have an understanding of the requirements of relevant capital markets. Further, to estimate cost of capital, regulators need key information about financial markets sufficient to make informed decisions about utilities' capital structure, costs of debt, and costs of equity in a timely and structured manner. This means that regulators should have:

- a basic understanding of how capital markets work
- knowledge of analytical techniques for estimating cost of capital
- access to timely and adequate capital markets information and data to understand trends and changing requirements of current capital markets

This report reviews the significance of financial markets to regulation, describes how key variables (such as cost of capital) are calculated, and describes opportunities for regulators to become educated about relevant financial market activity.

Regulating IOUs

For the purposes of this report, it is sufficient to recognize that all of the regulatory jurisdictions in the United States regulate investor-owned electric utilities and natural gas distribution utilities as “public utilities” or IOUs. In a few states, regulatory authority is also granted over some municipal- and cooperative-owned utilities. Financial markets play a limited role in municipal- and cooperative-owned utilities, and a larger role in IOUs due to the capital structure of an IOU.

Financial Markets

The financial markets for stocks and bonds, widespread availability of financial instruments, and existence of numerous financial institutions in the United States provide investors with the opportunity to specialize in particular markets, or diversify risk, to achieve economic growth for their investments. One specialized market is part of the \$100 billion per year investment in securities and debt of IOUs.

IOUs compete in these financial markets with other companies and industries for (low-cost) capital. The largest US financial markets are, in order of size: corporate equities, home mortgages, corporate and foreign bond, US government securities, federal repurchase agreements, and open market commercial paper.¹

¹ Federal Reserve Bank of San Francisco, “Education: Please explain how financial markets may affect economic performance,” January, 2005, <https://www.frbsf.org/education/publications/doctor-econ/2005/january/financial-markets-economic-performance/>

The major US financial institutions (and funds) who invest through these markets include, by order of size: US commercial banks, mutual funds, private pension funds, life insurance companies, government employee retirement funds, money market funds, security brokers and dealers, savings institutions, finance companies, other insurance companies, credit unions, and foreign banking offices in the United States.

It is these financial institutions and funds where each financial market provides the price signals for credit and returns on investment, directing funding to those who most highly value it. The markets connect the willing borrower to the willing lender. The existence and operations of the US financial markets also facilitates flow of funds between countries.

One important consideration is that equity market investors and credit market investors are different. The underlying function of the instruments they are buying are distinct and the investors have very different expectations and considerations of their characteristics.

- In rating securities, for example, common stock (equity) investors will look at an appraisal of past performance of earnings and dividends.
- Meanwhile, creditors will be concerned with the likelihood of default on promissory securities such as debt and preferred stock.

The investors in these two cases are buying different products and are not the same.

The Regulators' Roles and Responsibilities

In simplified terms, the purpose of public utility regulation is to ensure service to consumers at reasonable prices and, with that, attract capital sufficient to build and maintain adequate service. The Federal Energy Regulatory Commission (FERC) has an obligation under federal law to approve “just and reasonable” rates or charges for generation and transmission services within its jurisdiction. State PUCs have similar mandates in their own statutes and regulations that pertain to utility services within their jurisdictions.

The attraction of capital is significant for energy utilities because they are capital-intensive and, in many cases, need to raise more than \$100 billion a year to finance electric and gas infrastructure. Among the public utility regulators' roles is to estimate what the requirements of the capital markets are at any point in time (e.g., expected return on investment) such that IOUs can raise sufficient funds to make necessary infrastructure investments.

Alfred Kahn described the duties of the regulator as: control of entry, price fixing, prescription of quality and conditions of service, and the imposition of an obligation to serve all applicants under reasonable conditions.² In practice, Kahn's list of duties requires the regulator of an IOU, under traditional regulatory schemes, to make determinations that typically include:

- Designation of service area (franchise);
- Approval of tariffs (rates and conditions of service);
- Requirements for accounting and reporting;
- Pre-approval of construction;
- Establishment of depreciation rates;
- Approve of the sale, purchase, or exchange of assets;
- Setting standards of service and operations; and
- The review and approval of the issuance of debt and securities.

² Alfred Kahn, *The Economics of Regulation: Principles and Institutions* (John Wiley & Sons, 1970).

The most important decisions surrounding public utility regulation occur in the determination by the regulator of “just and reasonable rates” subsequent to a rate case proceeding. That determination is made in an order issued by the regulator following evidentiary hearings usually conducted by an administrative law judge or hearing examiner.

During the rate case proceedings, the regulated IOU presents evidence and testimony supporting a requested tariff including levels of rates, rate design, and other conditions of service. The staff of the PUC and other parties then can review the utilities’ submitted reports, cross examine the IOU’s witnesses, and present their own study and witnesses for the regulators’ consideration. The Commissioners may or may not sit in during the proceedings to hear testimony or cross examine witnesses but the full record is available to the members of the commission and is the basis for their determination and final order.

The utilities’ rate case is built around its estimate of an *annual revenue requirement* sufficient to cover all expenses and provide an adequate return to its investors.

Ratemaking Formulas

Rate Base and Annual Revenue Requirement

The development of an estimate of an IOU’s *annual revenue requirement* begins first with an establishment of the needed investment in assets (plant investment) required to provide reliable, safe, and adequate service. This permanent level of investment in assets and other capital required is termed the *rate base*. While the exact components of the *rate base* differs from state to state, the general construct is shown in **Table 1**.

Table 1. Rate Base

$$\begin{aligned} & \$ \text{ Original Cost of Plant Investment} \\ & - \text{ \$ Depreciation Reserve} \\ & = \$ \text{ Net Plant Investment} \\ & + \text{ \$ Other Items as approved by regulator} \\ & = \$ \text{ Rate Base} \end{aligned}$$

The *annual revenue requirement* is shown below in **Table 2**.

Table 2 Annual Revenue Requirement

$$\begin{aligned} & \$ \text{ Annual Operating and Maintenance Expense (Est.)} \\ & + \$ \text{ Annual Depreciation Expense*} \\ & + \$ \text{ Annual Taxes} \\ & + \text{ \$ Annual Return*} \\ & = \$ \text{ Annual Revenue Requirement (= Cost of Service)} \end{aligned}$$

*Note that two components, “depreciation” and “return,” are developed from the rate base.

Cost Category	Calculation	Description
*\$ Annual Depreciation Expense	\$ Plant investment at original cost multiplied by annual depreciation rate (percent per year) of the rate base	The <i>annual depreciation expense</i> is calculated by applying the annual depreciation rates, approved by the regulator, to the approved rate base accounts.
*\$ Annual Return	\$ Rate Base multiplied by the rate of return (%/yr.)	The return on rate base (“annual return”) is estimated by applying the rate of return, determined by the regulator, to the previously approved rate base investment.

An *annual revenue requirement* is then approved by the regulator based on the annual amounts in the four cost categories in **Table 2**.

The total of the approved *annual revenue requirement* becomes the annual “*cost of service (COS)*” for the utility. This approved COS is used to allocate costs among various services and classes of customers for the determination of the final rates. The final rate order of the regulator specifies the rates which must be charged for service and are due from customers for service.

Legal justifications for including the *cost of capital* in the cost of service

In 1923 the U.S. Supreme Court ruled in *Bluefield Water Works v. Public Service Commission* (262 U.S. 679, 690) that rates that are too low are unjust, unreasonable and confiscatory, and their enforcement deprives a utility of property rights protected by the Fifth and Fourteenth Amendments to the Constitution.

Two decades later, in 1944, the U.S. Supreme Court would confirm in *Federal Power Commission et al. v. Hope Natural Gas* (320 US 591, 602) referred to as “*Hope*,” that while the regulation must protect consumers, it must also ensure that utilities can earn a rate of return “*commensurate with returns on investments having corresponding risk*” and “*sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital*.”

Cost of Capital and Rate of Return

One of the key elements of any rate case (and one most open to controversy) is that of determining the appropriate “cost of capital” also known as “rate of return.” Whatever the final determination, as former Illinois Commerce Commissioner Dr. Karl McDermott observed, “*Calculation of the firm’s cost of capital is generally one of the most contentious issues in a rate case.*”³

Professor James Bonbright devotes two chapters of *Principles of Public Utility Rates* to this topic: “Chapter X, Criteria for a Fair Return” and “Chapter XV, The Fair Rate of Return.” At one point, he observes that:

“The conflict is by no means limited to disagreements on questions of fact or prophecy. It also extends to express or implied disagreements on the very meaning of ‘fair’ rate of return...”

³ Karl McDermott, *Cost of Service Regulation In the Investor-Owned Electric Utility Industry* (EEI, 2012).

The importance of an estimation of the cost of capital was recognized by the earliest regulators before the turn of the last century and is best described in this extract from *Valuation and Rate-Making* by Robert L. Hale, published by Columbia University Press in 1918.

“The cost of capital need is a part of the cost of service that in the long run must be borne by the consumer if the service is to be furnished. This cost, like most other costs, is fixed in the open market by economic forces over which individuals and companies have little or no control.”

To inform the following discussion of the regulatory process, *Regulatory Finance: Utilities’ Cost of Capital*, by Roger A. Morin, provides the following definitions:

Cost of Capital: The aggregate return required by investors. The opportunity cost expressed in percentage terms of the total pool of capital employed by the utility.

Cost of Debt: The embedded cost of debt is the total interest payments divided by the book value of the outstanding debt.

Rate of Return: The cost of capital or the opportunity cost of the total funds employed by the utility.

Return on Equity: The investor’s current opportunity cost in investing in the equity of that utility.

Weighted Average Cost of Capital: the weighted average of each individual component of the capital structure weighted by its book value.

In the determination of an appropriate cost of capital/rate of return (**Table 3**), the regulator is looking to find the minimum rate of return that will meet the requirements of capital attraction at minimal cost to consumers. In this search, the regulator is informed by the operation of capital markets that are the sources of debt and equity capital. Not only are the individual elements subject to controversy (annual cost of debt and equity), but the *capital structure* (percentage of debt to equity) is also an item of contention.

Capital Structure & Estimating the Cost of Capital

To sum up, the plant investment in the rate base is funded by a combination of debt and equity (the capital structure/ capitalization ratios) in proportions approved by the regulator. The regulator must estimate and approve both the capital structure (capitalization ratios), as well as the costs of equity and debt. **Table 3** illustrates the relationships.

Table 3. Example Estimation of Rate of Return

	Capitalization Ratio	Annual Cost Rate	Weighted Annual Cost (Capitalization ratio multiplied by the annual cost rate)
Long-Term Debt	50%	7.5%	3.75%
Preferred Stock	6%	9.0%	0.54%
Common Stock Equity	44%	13%*	5.71%
Cost of Capital	100%		10.0%**

*Return on equity (ROE)

** Rate of return and weighted average cost of capital

Appendix A: Return on Equity Estimation Models includes a list of the most common methods presented before state regulatory commissions for how these calculations are made, as well as some new methods under consideration.

Annual Reviews

Although the emphasis here is on the estimation of the cost of capital for the purposes of a rate case order, there is an additional analysis (sometimes overlooked) in which information about the requirements of capital markets is vital. This is during the annual review of utility financial performance undertaken at the end of each year by both regulators and utility management and widely observed by other interested parties including customers and investors.

At the end of each fiscal year, the regulated utility reports its results, including the rate of return achieved during the year. These reports include: the annual report to shareholders and the Securities and Exchange Commission, Federal Energy Regulatory Commission Form 1, including financial and operational data, and any other reports required by the regulator.

The reported and achieved ROE is then compared with an estimation of what the capital markets will need to fund future capital expansion. State PSCs may require the IOU to also estimate what ROE would have been experienced under the conditions of “normal” weather and other adjustments made in the previous rate case. This “normalization” provides a third ROE number to be considered by both utility management and the regulators.

Should utility management determine that existing rates, continue into the future, will not produce an adequate return on investment, then a rate case increase request will be considered. The issue is not whether or not the achieved rate of return is above or below the rate of return used by the regulator in the last rate case to set rates. That order, and the commensurate estimate of cost of capital, may have been issued years ago under very different capital market conditions that no longer apply. The issue is whether the expected returns under current market conditions will be adequate.

Another reason for regulators to review the *achieved rate of return* is to question if continuing current rates into the future may result in the utility achieving returns in excess of capital market requirements.

Thus, even without a rate case pending, regulators need real-time access to and understanding of capital markets requirements for funding of public utility infrastructure.

The type of information needed to understand financial markets would include a periodic review of:

- Trends in utility stock prices
- View of market volatility
- Changes in 10- and 30-year US treasury bond yields
- Utility dividend yield changes
- Changes in credit spreads
- Capital investment trends and projections
- Historic and current allowed returns on equity

This type of information is available from a variety of sources. However, PSC staff have expressed concerns that in many cases the most convenient sources of this information are from fee subscription services not always within the budgets of state PSCs. Also see **Appendix C**.

Financial Markets Perceptions' of Regulatory Risk

One of the benefits of establishing an ongoing dialogue between regulators and financial market participants is to introduce new regulators to the markets' perceptions and understanding of "regulatory risk."

Professor Burkhard Pedell,⁴ in *Regulatory Risk and The Cost of Capital*, presents the "...development of a comprehensive economic concept explaining the impact of rate regulation on the risk and the cost of capital of regulated firms. Pedell observed that "the risk to which regulated firms are actually exposed depends crucially on the design of the regulatory scheme..." and that "When designing the regulatory scheme, the regulator or legislator must be aware of the effect on the behavior of market participants." Pedell concludes that "the causes of regulatory risk are the individual design variables of the regulatory system and process."

Regulatory risk has been reported for years by such organizations as SNL RRA in its annual report in the form of state regulator "rankings." These reports rank the state commissions with respect to regulation more or less "favorable" to investors by providing an explanation of the criteria used in establishing the rankings. The criteria include those regulatory practices deemed by the ranking entity to increase or decrease regulatory risk from the aspect of the investor.

Professional analysts can differ as to the selection and weighting of different factors; nonetheless, these rankings can be informative to regulators.

Traditionally these issues have included regulatory treatments and practices such as:

- Perceived transparency of orders (does the order adequately explain how the law and evidence leads to the decision);
- Comparative timeliness of decisions, public perception of regulatory balance;
- Availability of judicial review;
- Stability of orders (do similar factual and legal situations result in similar outcomes), and;
- Sufficient independence of regulators from political pressure to gain public and financial market acceptance.

However, regulatory treatments change over time and thus there is a constant flow of new information and a commensurate adjustment to the financial markets' real-time perceptions of regulatory risk in each jurisdiction. Thus, an ongoing dialogue and information flow is critical for enhanced regulation and regulatory decisions.

Knowledge Requirements and Roles of Regulators

Although the Commissioners and professional staff are collectively the "regulators" of the IOU, they have different functions, roles, and tenure in regulation.

Commissioners

The states' elected or appointed public utility commissioners each bring unique professional and educational history and experience to the position. The typical backgrounds for commissioners are positions in the legal, legislative, financial, business, regulatory staff, and academic fields. Few states require direct public utility regulatory or management experience for appointment. Indeed, in many states, prior utility experience is considered a barrier, for example by consumer advocate groups and other interested parties to appointment.

⁴ Burkhard Pedell, *Regulatory Risk and the Cost of Capital* (Berlin: Springer), 2006.

Commissioner Tenure

The number of commissioners per state varies between three and seven. Typical terms of office are four or six years; many are not reappointed to a second term. Rarely are individuals able to establish a career as a public utility commissioner covering a few decades.

A 2005 study by the Center for Public Integrity identified 42 percent of then-serving commissioners as having served in state legislatures or in state government in gubernatorial appointed positions, whereas 13 percent once held jobs in regulated industries before becoming regulators. Hence, some regulators may come to their positions with significant financial and capital markets knowledge, whereas others may not.

For the most part, individuals serve a term, sometimes less, and move on to other careers. A 2013 analysis by Advanced Energy Economy indicates that turnover among commissioners was about 25 percent per year.⁵ The average service experience of current commissioners is available on the AEE PowerPortal in a state-by-state presentation.⁶

Taking the top five states by population, the experience of the serving state public utility commissioners today is 2.8 years in California, 2.0 in Texas, 3.3 in Florida, 3.2 in New York, and 3.7 in Pennsylvania. Upon inspection, these are typical service periods. However, a few states show experience at higher levels, such as Georgia at 8.4 years and South Dakota at 9.7 years.

Reflecting on becoming a regulator without prior experience, Philip Jones, former 12-year Washington state commissioner, wrote that “*prior to accepting appointment...I certainly did not understand the nuances and complexities of embedded cost-of-service regulation for regulated electric and gas utilities,*” calling it “*the most difficult state government job today.*”⁷

Once assuming the role of a commissioner, new regulators are required to review testimony and exhibits designed to persuade them of the correct estimation of the capital markets’ requirements for debt and equity costs into the future. The future aspect is important as utility rate-making is prospective and rates are set today for services to be delivered in the future. The rates issued today stay in effect until the regulator issues a new rate order approving new rates.

Thus, commissioners’ knowledge requirements with respect to capital markets revolve around the need for a basic understanding of how capital markets work and ongoing information about trends and developments in capital markets. The commissioners need sufficient knowledge to understand and process the validity of arguments, testimony, and exhibits presented to them by parties or their own advisors with sufficient background to make decisions. The commissioners need not be experts, but must have sufficient background to be able to confidently evaluate expert opinions.

⁵ <https://www.aee.net/articles/new-database-provides-a-window-into-public-utility-commissions-in-all-50-u-s-states>

⁶ <https://powersuite.aee.net/portal>

⁷ <http://www.theenergytimes.com/regulations-and-laws/toughest-job-government-regulators-mini-memoir>

Commission Professional Staff

The professional staff of a state public service commission is made up of civil service employees hired on a merit basis for their professional education and experience. They handle the day-to-day requirements of a state agency involved in the three ongoing functions of a regulatory agency: administration of rules, quasi-judicial decision-making, and policy creation. The professional staff are career staff. They are expected to run the operations of the agency as well as to advise the commissioners directly on issues before the commission.

Some states have a traditional structure in which all the regulatory staff are directly responsible to the commissioners. There are states, however, that have restructured their regulatory agencies to separate advisory staff (those directly under commissioners) from other professional staff directed by state law to represent certain consumer interests, or even appear as parties before the commissioners in proceedings.

Under either structure, professional regulatory staff require the development of, and ongoing maintenance of, a level of expertise commensurate with that in the private sector and available to the IOU. As former Commissioner Jones observed, *“When an electricity or gas crisis hits...we have the technical expertise with our staff that has accumulated over the years.”*⁸

For capital markets, this means that within a state commission, some level of expertise must be developed at the professional staff level. The professional staff should have the competence to advise the commissioners on recommendations of optimum capital structure and market-derived levels of debt and equity cost. This advisory staff will need: a) knowledge of analytical techniques for estimation of cost of capital and b) access to timely and adequate market information and data.

For states with small staff or limited rate case activity, two key issues have been identified in discussions with the NARUC advisory group for this study. First, there may be limited availability of training and second, access to financial markets information is expensive when the need for access is on a limited frequency basis. The resources provided that follow can help commission staff explore and overcome some of these challenges to ensure an adequate knowledge base.

Developing Regulators’ Knowledge of Financial Markets

Regulators may gain financial market knowledge through the following sources, described further below:

1. Prior professional experience and education
2. Testimony and exhibits in utility proceedings
3. Attendance at regulatory training programs
4. Attendance at NARUC sponsored and affiliated meetings
5. Attendance at industry-sponsored seminars, conferences, and roundtables
6. Engagement with peers through professional societies
7. University course work
8. Personal readings and study

⁸ <http://www.theenergytimes.com/regulations-and-laws/toughest-job-government-regulators-mini-memoir>

Knowledge Gained from Testimony and Exhibits

A review of the testimony and exhibits in a public utility rate case or other proceedings provides one valuable source of information about capital markets. This form of gaining knowledge is subject to limitations, however.

First, the quality of the information and its timeliness are dependent on numerous factors, including availability and quality of staff analysis and rebuttal testimony.

Second, commissions may find themselves in periods of low or infrequent rate case activity. In some states, there have been a dozen years or more in between rate case filings. In those periods, regulators will not see such testimony and yet still need to review capital market information during the course of their annual reviews. Third, the testimony in a rate case is limited to information and opinions about the financial requirements of the individual utility subject to the proceedings. That information may have limited value for considering financial issues facing other utilities under rate regulation in the state.

Finally, as a practical matter, commissioners may be faced with multiple cases, numerous other requirements, and limited time—not allowing them to personally review the direct, rebuttal, and surrebuttal testimony. In which case, they must rely on expert staff summary and analysis.

NARUC Regulatory Programs

NARUC holds three meetings per year. These are the Annual Meeting and Educations Conference, the Summer Policy Summit, and the Winter Policy Summit. Of the 11 programs reviewed in 2013-2017, six programs included at least one session related to capital markets. The results of that review are included in Appendix B. Further, topics related to capital markets were included in at least one general session in four of the past five years. These events are therefore a good opportunity for commissioners and commission staff to learn and engage on this topic.

Topics for the plenary sessions at these programs are established by the president of NARUC and its nine-member Executive Committee. Although the plenary topics are planned well in advance, last-minute changes are made to the programs to accommodate rapidly evolving developments of importance to the NARUC members.

Topics for the meetings of the NARUC committees are selected by the committee chairs, with input from committee members. The current committees include: Consumers and the Public Interest, Critical Infrastructure, Electricity, Energy Resources and the Environment, Gas, International Relations, Telecommunications, and Water. NARUC had a Committee on Finance and Technology from 1985 to 2004 that regularly addressed financial markets issues. NARUC's full board can close, add, or change committee names and functions. In the future, should capital market issues again become significant, NARUC can organize a committee around the issue as it has in the past.

It should be noted that NARUC also holds two multi-day New Commissioner Regulatory Orientation sessions. The 19th session was held April 23-24, 2018, in Washington, D.C. This is a peer-to-peer program limited to 10 commissioners at each session who have been elected or appointed during the past year. The program covers a wide variety of regulatory topics and ends with a session on “Key Principles of Accounting and Finance.”

At this time, NARUC does not have an institutional arrangement to bring financial market information to members on a regular basis. The individual regulator has primary responsibility for obtaining adequate information to perform the regulatory function and NARUC can assist through programs at its three yearly meetings. At these annual meetings, with programs crafted for the commissioners, regulators can gain an understanding of the financial markets' perceptions of the “design variables” in regulators' decisions that are viewed as affecting regulatory risk.

NARUC Affiliate Programs

NARUC has five regional regulatory affiliates in the United States. The programs cover topics of regional interest that have increased in importance the past few decades as FERC-regulated regional power markets (CALISO, ISO-NE, MISO, NYISO, PJM, SPP) have matured.

The five regional associations of state regulators are:

- Mid-America Regulatory Conference (MARC)
- Mid-Atlantic Conference of Regulatory Utilities Commissions (MACRUC)
- New England Conference of Public Utilities Commissioners, Inc. (NECPUC)
- Southeastern Association of Regulatory Utilities Commissioners (SEARUC)
- Western Conference of Public Service Commissioners (Western)

New additions to these regionals have been the entities organized around the power markets themselves: Organization of MISO States, Inc. (OMS), Organization of PJM States, Inc. (OPSI), and New England States Committee on Electricity (NESCOE).

A review of their program agendas demonstrates the high interest in these regional wholesale markets, even though they are under FERC jurisdiction (except Texas ERCOT market, which is wholly under the Texas PUC).

National Regulatory Research Institute (NRRI)

Another NARUC affiliate is NRRI, which was established in 1976 as the research arm of NARUC. The institute has produced numerous valuable reports on timely topics facing state regulators in electricity, gas, water and telecommunications. However, a review of the reports issued the past five years does not find any reports obviously focused superficially on financial markets topics. The professional research staff of NRRI could be a resource for future education, training, and information on issues relating to financial markets and IOUs.

NARUC Endorsed Training Programs

A number of NARUC resident training programs are available to commissioners and regulatory commission staff around the US. These programs are well regarded but require the participant's agency to provide funding and time to attend. Some are one week and others are full two-week programs. Reviewing the topics for these programs, it is apparent that the amount of time devoted to the issue of capital markets is limited in most of these programs. Nonetheless, new commissioners and new regulatory staff are encouraged to apply for funding and attendance. Recent programs are summarized below:

- a. 60th Annual Regulatory Studies Program "Camp NARUC" 2018 East Lansing, Michigan
 - i. Fundamentals Course August 6-10, 2018
 - ii. Intermediate Course August 13-17, 2018
- b. NARUC Utility Rate School May 13-18, 2018 San Diego, California
- c. NARUC Utility Rate School October 22-26, 2018 Clearwater Beach, Florida
- d. New Mexico State University Practical Regulatory Training ("The Basics"), May 21-25, 2018 Albuquerque, New Mexico
- e. Michigan State University Institute of Public Utilities Grid School, April 9-12, 2018, East Lansing, Michigan

- f. University of Missouri Financial Research Institute Public Utility Symposium: Innovation in Public Utility Business Models and Financing for the 21st Century, September 26, 2018, Columbia, Missouri
- g. Wisconsin Public Utility Institute–Energy Utility Basics Course

Industry-Sponsored Seminars and Training Programs

Individual regulators have been participants in capital market programs sponsored by utilities, financial institutions, ratings agencies, and consultancies. The programs have included everything from the former Irving Trust 1980s week-long workshops (which transferred to Bank of New York in 2003) to Bank of America Securities’ 2006-initiated “Meet a Commissioner Day,” most recently sponsored at Barclays Bank. This program, however, was more focused on having state commissioners, in five panels of three, being interviewed by investment analysts. In its design, the program is more of an opportunity for the analysts to gain insight into state regulatory thinking than an educational or informational program for state regulators.

The longest running financial industry-state regulator program is the Gee Strategies’ Wall Street Executive Dialogue program for state commissioners established by former Texas PUC Chairman Robert Gee. This program was launched in 2003, continues today, and is typically held once or twice per year. The invited attendees are a mix of about 20 new commissioners, regulatory staff, and representatives of the National Association of State Utility Consumer Advocates (NASUCA) and 20 analysts from credit rating companies, buy-side and sell-side analysts, and investment bankers.

The multi-day program includes a presentation by a panel of utility CEOs followed by Chatham House rules’ discussions of topical financial issues. The organizer makes the invitations to new commissioners with considerations to geographic diversity. Based on state ethics guidelines, the commissioners’ and other participants’ travel expenses are either billed to the agency or are covered by the meeting convener Gee Strategies.

Although no doubt valuable to the attendees, this is a limited program. The program provides current financial information and limited basic training in financial markets. The dialogue is approximately two days and regulators are invited only once. Under the current system, roughly 20 to 30 commissioners per year have access.

Professional Societies

There is one organization specifically established to review public utility interface with capital markets. The *Society of Utility and Regulatory Financial Analysts (SURFA)*, originally established in 1977 as the National Society of Rate of Return Analysts and renamed in 1996, was founded by a cross section of utility industry, regulatory staff, and financial markets analysts. The objectives of the SURFA are the presentation of rate of return analysis defined as:

...the study of economic, financial and other pertinent facts and forecasts for the purpose of appraising risk and reflectively determining an appropriate level of profitability or rate of return on investment in regulated and non-regulated industries.

Since 1991, the SURFA has provided an educational service in the form of a Certified Rate of Return Analyst (CRRRA) program based on education, experience, and examination. SURFA is mentioned in this report as a recommended activity for state regulatory staff designated to review, analyze, and or rebut rate of return testimony presented in regulatory proceedings. This report recommends that state regulators make available training funds so that selected staff members can attend SURFA programs and seek CRRRA professional designation.

Another professional qualification demonstrating expertise in financial analysis is that of the *Chartered Financial Analyst (CFA)*. This professional credential is offered by the CFA Institute and is available to university graduates with four years of professional work experience in an investment decision-making process after successfully passing three exams.

Professional development of state staff is also available in the area of depreciation analysis with membership in the *Society of Depreciation Professionals*. Whereas rate of return involves return on capital, depreciation (also called capital recovery) is directed at the return “of capital” over its economic life. It is common that the rate of return analyst will assume that the depreciation rates approved by the regulator are correct. However, this is only as reliable an assumption as the professional basis upon which the depreciation decisions are made. Hence, here too trained professional regulatory staff are needed to inform the commissioners.

Personal Professional Development

Regulators can supplement their initial knowledge of financial markets, gained before appointment or election, with individual targeted readings and study. The readings can include: textbooks, industry white papers, reports from other state and federal regulatory agencies, magazines, journals, monographs, blogs, and information from social media outlets.

A list of recommend textbooks applicable specifically to the case of regulated rate of return is attached as **Appendix C**. Although some of the books are out of print, all are available on the market over the Internet either as second hand or in modern reprint. The list was assembled with assistance from SURFA members.

Consideration should be given within a commission to the establishment of a regulatory book club, where the selected text material can be discussed and participants can benefit from the diverse knowledge of book club members from finance, accounting, engineering, legal, and rates departments. Deloitte successfully used this method from 2009 to 2018 to increase knowledge among its professionals using a conference call format for discussions among book club members located all around the United States.

Appendix A: Return on Equity Estimation Models

Models for return on equity (ROE) estimation using stock prices are based on what is known as the “Efficient Market Hypothesis,” which postulates that the stock market is “efficient” and thus reflects the incorporation of all relevant and ascertainable information in a stock price.⁹

The most common models used in testimony before PSCs have been:

- Discounted Cash Flow (DCF)
 - Based on the “dividend discount model” of financial theory where the value (price) of a security is the discounted present value of all future cash flows. The DCF method inputs stock price and future dividends and solves for the discount (rate of return).
- Capital Asset Pricing Model (CAPM)
 - Describes the relationship between a security’s investment risk and its market rate of return to estimate a return comparable with market returns by securities that have similar risk.
- Risk Premium Models (RPM)
 - Based on the proposition that common stocks are more risky than debt and that cost of equity is the cost of debt plus a risk premium.
- Comparable Earnings Model (CEM)
 - Based on the premise that a fair return is one that equals the book rates of return earned by comparable risk firms.

Economic and financial research is developing and testing new ROE models such as:

Arbitrage Pricing Model

- Fama-French 3-Factor Model
- Behavioral Finance
- Option Market Implied Cost of Equity Model
- Predictive Risk Premium ModelTM

As with many other things new in regulation, adoption of these new ROE estimation models, if at all, will be slow, especially if some parties do not like the estimates these models provide.

⁹ David C. Parcell, *The Cost of Capital: A Practitioner’s Guide* (Society of Utility and Regulatory Financial Analysts, 1997).

Appendix B: NARUC Programs with Financial Markets Sessions

NARUC holds three meetings per year: the Annual Meeting and Education Conference, the Summer Policy Summit, and the Winter Policy Summit. Presentations are available from past programs: <https://www.naruc.org/meetings-and-events/past-meetings/>.

The following list includes a summary of programs in 2013-2017, which included financial markets as the main topic. The review included subcommittee, committee, and general session topics.

2017 NARUC 129th Annual Meeting and Education Conference

General Session: **Shooting the Bull... What Regulators Need to Know to Understand Wall Street**

Moderator: Hon. Diane Burman, New York

Panelists:

Joyolin Brown, VP & Senior Analyst, Duff& Phelps Investment Management

Heike Doerr, Principal Analyst, S&P Global Market Intelligence

Anthony Ianno, Managing Director, Morgan Stanley

Greg Gordon, Senior Managing Director, ISI Group LLC

Leslie Rich, Managing Director, Equity Analyst, JP Morgan Asset Management

2017 Summer Policy Summit

Staff Subcommittee on Energy Resources and the Environment:

Energy Efficiency Financing for Low- and Moderate-Income Household

2017 Winter Policy Summit Presentations

Committee on Consumer Affairs: **Inclusive Financing for Distributed Energy Solutions**

2016 NARUC 128th Annual Meeting

General Session **Market Darlings: Understanding the Appeal of Regulated Utilities in Today's Capital Markets**

Moderator: Hon. David Ziegner, Indiana

Participants:

Hon. Ron Brisé, Florida

Hon. Moin Yahya, Alberta Utilities Commission

James Coyne, Senior Vice President, Concentric Energy Advisors

Randy Woolridge, Professor of Finance, The Goldman, Sachs and Frank P. Smeal Endowed University

Fellow in Business Administration, President, Nittany Lion Fund, LLC, The Pennsylvania State University

2016 Winter Committee Meetings Presentations; 2015 Winter Committee Meetings; 2015 NARUC 127th Annual Meeting

None

2015 NARUC Summer Committee Meetings

General Session: “Financing the Future”

Moderator: Hon. Lisa Edgar, Florida

Participants:

Carolyn Brandon, Sr. Industry Fellow, Georgetown University

Nat Kremer, CEO, Clean Power Finance

John McAvoy, Chairman and CEO, Consolidated Edison, Inc.

Bob Nelson, Consumer Counsel, Montana

Dena Wiggins, President and CEO, NGSA

Subcommittee on Utility Market Place Access:

Financial Challenges in Engaging Renewable Energy Markets

Moderator: Hon. Greg White, Michigan

Participants:

Gilbert Campbell, Managing Partner, Volt Energy

Frederick Royall, CEO, Royal Capital Holdings, LLC and Sun Edison

Monday July 13, 2015 Committee on Gas

Simon Flannery, Managing Director, Morgan Stanley

Frank Louthan, Raymond James

Craig Moffett, Partner, MoffettNathanson

Sheldon C. Peterson, CEO, NRUC CFC

**2014 NARUC Annual Meeting; 2014 Winter Committee Meetings;
2014 NARUC Summer Committee Meetings**

None

2013 NARUC 126th Annual Meeting

General Session: “Put Your Money Down: Getting the Right Investment Mix in the Current Infrastructure Investment Cycle”

Moderator: Hon. James Gardner, Kentucky

Participants:

Dan Bakal Director, CERES

Julian Dumoulin-Smith, Ex. Dir, Equity Research, UBS Securities LLC

Jim Hempstead, Assoc. managing director, Moody's

Alan James, Sr. Managing Director, Macquarie Securities, Inc.

2013 NARUC Summer Committee Meetings; 2013 NARUC Winter Committee Meetings

None

Appendix C: Books on the subject of Rate of Return

List of books on rate of return for regulated utilities and capital markets by date of publication.

1. Public Utility Rates

Author: Harry Barker
Publisher: McGraw-Hill Book Co.
Year of Publication: 1917
Place of Publication: New York, NY

2. Principles of Public Utility Rates

Author: James C. Bonbright
Publisher: Columbia University Press
Year of Publication: 1961
Place of Publication: New York, NY

3. Ruling Principles of Utility Regulation: Rate of Return

Author: Ellsworth Nichols, Francis X. Welch
Publisher: Public Utility Reports, Inc.
Year of Publication: 1964
Place of Publication: Washington, DC

4. The Cost of Capital to a Public Utility

Author: Myron J. Gordon
Publisher: MSU Public Utility Studies
Year of Publication: 1974
Place of Publication: East Lansing, MI

5. The Cost of Capital: Estimating the Rate of Return for Public Utilities

Authors: Lawrence Kolbe, James A. Read, Jr., George R. Hall
Publisher: MIT Press
Year of Publication: 1984
Place of Publication: Cambridge, MA

6. Principles of Public Utility Rates

Authors: James C. Bonbright, Albert L. Danielson, David k. Kamerschen
Publisher: Public Utility Reports Inc.
Year of Publication: 1988
Place of Publication: Arlington, VA

7. Regulatory Finance: Utilities' Cost of Capital

Author: Roger A. Morin
Publisher: Public Utilities Reports Inc.
Year of Publication: 1994
Place of Publication: Arlington, VA

8. The Cost of Capital – Intermediate Theory

Author: Seth Armitage
Publisher: Cambridge University Press
Year of Publication: 2005
Place of Publication: Cambridge, UK

9. Regulatory Risk and the Cost of Capital: Determinants and Implications for Rate Regulation

Author: Burkhard Pedel
Publisher: Springer
Year of Publication: 2006
Place of Publication: Berlin, Germany

10. Cost of Capital in Litigation: Applications and Examples

Authors: Shannon P. Pratt, Roger J. Grabowski
Publisher: John Wiley & Sons, Inc.
Year of Publication: 2011
Place of Publication: Hoboken, NJ

11. The Lawyer's Guide to The Cost of Capital - Understanding Risk and Return for Valuing Businesses and Other Investments

Authors: Shannon P. Pratt, Roger J. Grabowski
Publisher: American Bar Association
Year of Publication: 2014
Place of Publication: Chicago, IL

12. Risk and Return for Regulated Industries

Authors: Bente Villadsen, Michael J. Vilbert, Dan Harris, A. Lawrence Kolbe
Publisher: Academic Press
Year of Publication: 2017
Place of Publication: Cambridge, MA

13. 2017 Valuation Handbook | U.S. Guide to Cost of Capital | Market Results Through 2016

Author: Duff & Phelps
Publisher: John Wiley & Sons, Inc.
Year of Publication: 2017
Place of Publication: Chicago, IL

