Experts Group Meeting on Power Procurement Management

Points of Discussions

A copy of the paper titled "Portfolio Management, Notification of HERC, Cost efficiency power procurement" are enclosed for perusal of the participants

The Power procurement is becoming one of the most important aspect for utility management. In the present context of energy trading becoming more and more essential as an ingredient for availability of power to the consumers, the procurement management becomes a better tool for customers satisfaction and to meet the consumer requirement. The power utilities have to be alert to the very fast changing pattern of the load and needs a close watch of the parameters that affect the load.

Keeping the above in view, the participants may discuss the importance of the following aspects:

- ***Load Forecasting (Short Term / Long Term)***
- ***Demand side Management***
- ***Consumer Tariff***
- ***Role of Regulatory Agencies***
- ***Market Impact of Renewable Power Project***
- ***Benefit-Cost Analysis of New Transmission***
- ***Energy Contract Litigation***

PAPER-I

Portfolio Management, Generation Supply Planning, & Procurement

Electric utilities have an obligation to provide reliable service at reasonable rates. In jurisdictions where utilities continue to have the exclusive right to provide generation, transmission, and distribution services to customers in their service territory, this obligation applies to all of these services. In jurisdictions that have restructured their electric industry to allow retail competition, i.e. to allow customers to choose their generation service provider, this obligation continues to apply to the entity providing “Standard Offer” or “Default” generation service as well as to the electric utility providing distribution service.

Thus, regardless of the structure of the electric industry, providers of generation service continue to have an obligation to provide reliable service at reasonable rates. One way to achieve this result is to use portfolio management techniques in the design of the generation mix. This means choosing a diversity of generation technologies, a diversity of generation fuels, a diversity of suppliers and a diversity of contracts. In the gas industry, local distribution companies (LDCs) have been using a portfolio management approach for their gas supply planning, contracting, and procurement for many years.

To achieve this mix, various generation procurement processes can be implemented, including auctions and requests for proposals, each of which has its benefits and disadvantages. Issues that arise in procurement practices include timing and duration of contracts, process evaluation parameters (process transparency, affiliate transactions, and market power), the role of renewable, energy efficiency, and the use of financial hedging instruments.

Synapse’s work on portfolio management with respect to power procurement includes:

- Exploring strategies and evaluating residential and small commercial basic service procurement processes in Maine, Delaware, Connecticut, and Ohio
- Testifying on procurement methodologies in Illinois, including role of renewables and energy efficiency
- Determining the reasonableness of the results of New Jersey’s auction for basic generation service
- Quantifying the difference and significance in price of short versus longer-term contracts and their respective impacts on customers’ bills
- Exploring the relationship between gas prices and electricity prices and offering strategies on reducing rate price risks

The Green Power Partnership is a voluntary program that supports the organizational procurement of green power by offering expert advice, technical support, tools and resources. Partnering with EPA can help your organization lower the transaction costs of buying green power, reduce its carbon footprint, and communicate its leadership to key stakeholders. Green power is electricity produced from a subset of renewable resources, such as solar, wind, geothermal, biomass, and low-impact hydro. Buying green power is one of the easiest and most effective ways to improve your organization's environmental performance.

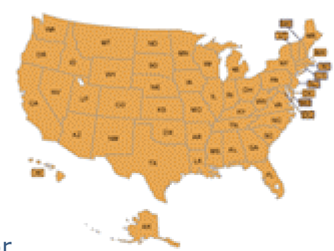
Steps to becoming an EPA Green Power Partner:

- 1Estimate annual electricity use
- 2Review purchase requirements
- 3Find and buy green power products
- 4Complete partnership agreement
- 5Communicate your purchase

What You Need to Get Started

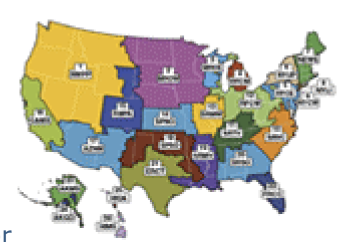
- Guide to Purchasing Green Power (PDF) (50 pp, 1.1MB, About PDF)
- Partnership Requirements (PDF) (19 pp, 690K, About PDF)
- Partnership Agreement (PDF) (2 pp, 1M, About PDF)

Find Green Power Providers



Green Power Locator

Calculate Your Avoided Emissions



Green Power Equivalency Calculator

Capabilities

Renewable Generation Resources

Renewable generation resources offer a variety of benefits for electricity customers, and for society as a whole. They provide a hedge against the high cost of fossil fuels, increase the diversity of the electric generation mix, and reduce the risks of electric price volatility. In most cases, they result in little or no environmental impact, and thus represent one of the most promising opportunities for mitigating the environmental effects associated with electricity generation.

In addition, renewable resources help support the local economy and local jobs, while reducing the amount of money that is exported out of the region to support conventional generation fuels. Small renewable generators can be located on or near a customer's facility (i.e., distributed generation) can also help reduce the strain on transmission and distribution systems.

However, market forces alone do not typically recognize these many benefits, thus public policies and regulations are needed to ensure that renewable resources fulfill their proper role in the development of the electricity industry.

Synapse's work covers a variety of topics related to renewable generation, including:

- Providing analytic and regulatory support for the development of regulations regarding renewable portfolio standards
- Conducting technical analyses of the potential for renewable resources, and the likely economic and ratepayer impacts of renewable portfolio standards
- Providing analytic support for the development of Renewable Energy Credit mechanisms or Generation Information Systems
- Estimating the emissions that could be displaced by renewable resources, for the purpose of using renewables to comply with environmental regulations such as SO_2, NO_X, and CO_2 cap-and-trade mechanisms
- Providing technical support for policies to encourage the inclusion of renewable resources in portfolio management practices and standard offer services provided by electric distribution utilities
- Reviewing the potential for renewable resources as alternatives to

- conventional fossil-fired generation, in the context of electric utility integrated resource planning
- Conducting detailed technical analyses – using electricity dispatch and market simulation models – of aggressive development of energy efficiency, renewable resources and distributed generation in regional and multi-state clean energy plans
- Providing analytic support for the rules and regulations that affect the integration of renewable resources in wholesale markets, Regional Transmission Organizations, and Independent System Operators

Electric Resource Planning

Many electric utilities have used an integrated resource planning (IRP) approach to identify the optimal mix of demand, supply, and transmission resources needed to ensure system resource adequacy and reliability at reasonable cost over a multi-year planning horizon. An IRP is an important input to the determination of whether a utility's generation mix and associated costs were prudent.

The restructuring of the electric industry that has occurred in many regions of the United States and Canada over the last 10 years has dramatically changed the approaches to and responsibility for long-term resource planning. The creation and evolution of regional transmission organizations (RTOs) and independent system operators (ISOs), along with a shift toward competitive market provision of generation supply has resulted in a dramatic reduction in the use of traditional IRP in jurisdictions where restructuring has occurred.

One part of the response to this new paradigm has been to ensure long-term reliability through the development and operation of resource adequacy or capacity "markets." However there has been little or no agreement on how to resolve the thorny technical, economic, and jurisdictional issues inherent in these approaches. At best, it is unclear if supposed market efficiencies arising from the paradigm shift have replaced the loss of IRP efficiencies. At a minimum, it is known that the reduction in utility planning efforts has led to foregone efficiencies in least-cost procurement of demand-side resources and has precipitated an overdependence on gas-fired supply resources.

Synapse works to understand the complicated dynamics of the wholesale electrical market and to examine the fundamental principles behind resource adequacy approaches. We also continue to review and critique integrated resource planning activities in those states where electric utilities remain vertically integrated.

Synapse's work covers a variety of topics on resource planning issues, including:

- Analysis of the PJM RTO's proposed Reliability Pricing Model (RPM) approach to resource adequacy
- Development of alternatives to the New England ISO's proposed Locational Installed Capacity (LICAP) approach
- Review and critique of electric utility integrated resource plans, including review of the technical and economic aspects of supply-side and demand-side resources, assessment of the processes used to integrate all types of resources, and the regulatory policies used to promote and guide integrated resource planning
- Conducting detailed technical analysis, using electricity dispatch and market simulation models, of aggressive development of energy efficiency, renewable resources, and distributed generation in regional and multi-state clean energy plans

Energy Efficiency & Load Response

Improving the efficiency of electricity, natural gas and fuel oil use in homes, businesses and institutions remains the most cost-effective and sensible resource for meeting energy service needs. Efficiency also offers a host of other benefits, including improved fuel diversity, improved system reliability, reduced environmental impacts of energy use, economic stimulation and job creation. However, tapping into this resource is impeded by market barriers, regulatory constraints and institutional inertia. Aggressive, innovative and comprehensive energy efficiency policies and programs are necessary in order for energy customers and society in general to enjoy the many benefits of this cost-effective resource.Synapse's work covers a wide range of energy efficiency and load response issues including:

- Reviewing and critiquing energy efficiency programs proposed by electric and gas utilities, including participation in demand-side management collaborative processes, and review of energy efficiency programs within utility integrated resource plans
- Development of regulatory and legislative policies to encourage all forms of energy efficiency activities, including system benefit charges, integrated resource planning policies, energy efficiency cost recovery policies, shareholder incentive and revenue decoupling policies, and third-party implementation of energy efficiency programs
- Assisting with the design, development and implementation of the energy efficiency programs for the Cape Light Compact, the municipal aggregator for Cape Cod and Martha's Vineyard
- Representing several New England consumer groups and attorney's general offices at ISO-NE meetings and helping to shape ISO-NE policies on demand response programs
- Conducting detailed technical analysis – using electricity dispatch and market simulation models – of aggressive development of energy efficiency, renewable resources and distributed generation in regional and multi-state clean energy plans

Distributed Generation & Distribution Systems

Distributed generation (DG) is a broad set of electricity generating technologies that are generally located on or near customer sites or along the distribution systems. DG technologies include, but are not limited to, reciprocating engines, Stirling engines, microturbines, fuel cells, photovoltaic cells, and small-scale wind turbines. When DG utilizes waste heat, it is often called combined-heat and power (CHP).

During the past decade, DG technologies have been advanced and have attracted significant public attention in that DG can provide real benefits to the electric system: improved reliability both for customers and the grid in general, reduced environmental impacts, increased efficiency of energy use, and reduced costs of energy services. Capture of those benefits, however, depends upon appropriate policy treatment of DG by both utility and environmental regulators, dealing with grid interconnection requirements, dispatch rules, siting issues, emissions standards, and tariffs for the times when the various customer-sited stand-by (or back-up) facilities are not operating.

Synapse's work on DG policies has focused on addressing these issues in order to promote the development of DG systems in order to facilitate cleaner, more efficient, cost-effective, and reliable energy services. Synapse's work on DG includes:

- Review of utilities' DG stand-by tariffs in the United States for the National Renewable Energy Laboratory and the California Energy Commission
- Review of utility practices to utilize DG/CHP to delay or avoid transmission and distribution system investment for the New York State Energy Research and Development Authority
- Economic and environmental evaluation of different DG and energy efficient technologies for low-income customers for the Low-income Energy Affordability Network
- Participation in the Massachusetts DG Collaborative meetings
- Technical support to MASSPIRG in the Massachusetts Department of Environmental Protection's rulemaking on emission standards for distributed generation. Synapse provided emission profiles of various DG technologies and a report on the health effects of diesel-engines

Short-term & Long-term Electricity Price Forecasting

Price forecasting plays a crucial role in planning and project development in the electricity markets, as well as in resolving contract disputes and projecting the impact of proposed market regulations and policies. While price forecasts are by definition subject to uncertainty, Synapse's work in this area stands out due to our attention to market fundamentals, our in-depth treatment of regulatory trends, and our ability to apply the most appropriate forecasting tools for any given project.

Synapse is well known in the industry for our thorough treatment of emissions costs – including projected carbon dioxide emissions costs – in our power price forecasts. In addition, we have applied our in-depth experience in generating technologies and applicable financial models to produce credible long-range electricity price forecasts in support of long-range planning exercises.

For detailed shorter-range market price forecasting and market analysis, Synapse applies the MARKETSYM model from Global Energy Decisions. This enables us to perform detailed scenario analysis on electricity markets, including transmission constraints, cost-based or strategic bidding, and analysis of proposed regulations.

Synapse has recently reviewed price projections for regional electricity markets to evaluate utilities' stranded cost estimates, project future electricity generation costs, evaluate demand-side management investments, and assess renewable portfolio standards.

Carbon Emissions & Climate Policy

Global climate change is perhaps the most significant challenge that we face as a civilization. Our voracious appetite for fossil fuels has caused the concentration of carbon dioxide in the atmosphere to rise sharply. During the preindustrial period (and at least 650,000 years prior to that) about 280 of every million molecules in the atmosphere were CO2 per molecules; today that number is 380, higher than in any other time in human history, and rising fast. Human consumption of fossil fuels is the leading contributing factor, with current emissions of about six billion tons of carbon each year.

The United States is responsible for about 25 percent of the global emissions of CO2 into the atmosphere each year, and the electric power sector accounts for approximately one-third of those emissions. The simple fact is that our appetite for energy is changing the atmosphere we depend on, and that will mean changes in climate during the coming century. The more carbon (and other greenhouse gases) we pour into the atmosphere, the more severe and costly those changes are going to be. In the absence of efforts on the national level to address greenhouse gas emissions, Synapse provides consulting and research services to environmental groups, state and city governments, regulatory bodies and companies who are taking the lead in reducing electric sector emissions of greenhouse gases.

Synapse works to understand the complicated dynamics of the wholesale electrical market and to examine the fundamental principles behind resource adequacy approaches. We also continue to review and critique integrated resource planning activities in those states where electric utilities remain vertically integrated.

Synapse's work on carbon emissions and climate policy has included the following projects:

PAPER-II

Cost efficiency in power procurement and delivery service in the electric utility industry.

Land Economics | August 01, 1997 | Thompson, Herbert G., Jr. | Copyright

I. INTRODUCTION

The current flurry of electric utility industry restructuring initiatives is the result of either individual utilities seeking increased marketing opportunities, or regulators seeking to reduce significant rate differences across regions. Initiatives from either source, however, will broadly fit into one of several restructuring models. One popular view from the firm's perspective shows the vertically integrated utility separating into a power generation unit and one or more regulated power delivery (transmission and distribution or T&D) units. Along with limited obligations for power supply services from the generation business unit during the transition phase, this model has the responsibilities for power procurement and merchant services residing with the T&D unit. Unbundled rates and declining power supply obligations in exchange for increased retail access and some form of performance-based regulation are also viewed as part of this model.(1)

Roberts (1986) analyzed the cost characteristics of a similar model of electric utility services using 1978 data. Although restructuring models of a decade ago were not as evolved as those of today, Roberts's theoretical development and empirical findings made a significant contribution to understanding the efficient behavior of what may be a major electric utility service provider during and following the transition phase of industry restructuring.

This paper builds on the theoretical foundations of Roberts's work and expands the empirical analysis so as to address some of the issues in the restructuring debate. These extensions include a series of cross sections from 1977 through 1992 that will capture the impact of legislative changes, such as the Public Utilities Regulatory Policy Act (PURPA) and the clean air amendments, evolving differences in regulatory policy, and changes in economic conditions that impact utility service efficiency and rates. Improved measures of the power supply price, capital costs, and cost allocation, and additional tests of the utility service separations hypotheses are also provided.

The paper is organized as follows. Following Roberts's development, the next section briefly discusses the model of the power procurement and delivery utility. Section III develops the empirical model and discusses the data. Section IV presents the empirical results. Section V contains a brief summary and concluding comments.

II. THE POWER PROCUREMENT AND DELIVERY COST MODEL

The cost efficiency of delivering power to the customer is affected by a number of