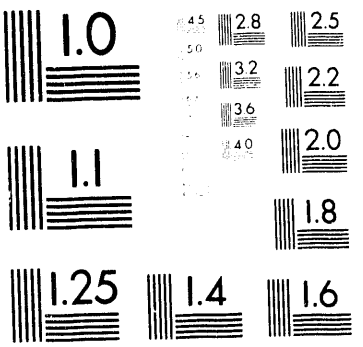
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ECONOMIC EFFICIENCY, IRPs AND LONG TERM CONTRACTS

by

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ABSTRACT

ECONOMIC EFFICIENCY, IRPs AND LONG TERM CONTRACTS[1]

There is no market failure that warrants utility regulation of the construction of new generating plants, the supply of energy efficiency or the purchase of fuel under contract. The natural monopoly problem applies to the distribution of electricity and gas, not to generation, energy conservation, or gas purchases. Utility regulation magnifies a market failure, which is the principal agent problem. Regulatory allowance of utilities signing long term fixed price contracts and undertaking conservation measures result in costs and risks being shifted to ratepayers that would not occur under competitive market conditions. Economic efficiency would be enhanced if cost of service regulation of electric and gas utilities were replaced by a competitive market process for the construction of new power plants, utility conservation programs and contracts to purchase fuel. Conservation measures could be supplied by energy service companies. Gas merchants could provide gas and energy conservation directly to ultimate customers, if they had access to LDC pipelines. With a competitive market established to sell gas and energy services, contracts and conservation measures would not require cost-of-service regulation.

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1. INTRODUCTION

Two of the more controversial topics in electric and gas utility regulation are integrated resource planning (IRP) and long term fixed price contracts, such as for natural gas. The issues involved in these topics may at first appear different and unrelated, but instead are similar. This paper examines inefficiencies inherent in the current regulatory process and proposes a market solution to eliminate the major inefficiencies and inequities resulting from IRP and from long term fixed price contracts.

The characteristics of IRP of interest in this paper are utility efforts to supply energy through new capacity and utility programs that supply conservation measures. We will not consider utility efforts to redistribute load. The most intriguing question of the IRP process is why utilities - electric and gas - should be in the business of supplying conservation measures that attempt to reduce the demand for their own product. A related question is whether the supply of energy services by utilities under cost-of-service regulation promotes the economically efficient use of energy resources. The literature on IRP takes the process as given and focuses more on the design, implementation and assessment of various conservation programs. There is an extensive debate on the appropriate criteria for selecting IRP programs. There is almost no consideration of whether utility conservation programs contribute to the efficient and equitable allocation of resources. This paper argues that IRP regulations are not justified on grounds of a market failure, but instead perpetuate an inefficiency due to a regulatory failure. As a result, IRP contribute to a misallocation of resources. IRP furthermore discriminates against low income customers.

The fuel purchasing issue is whether utilities should purchase at current market prices, or, whether they should be allowed to purchase gas under long term contracts, where the contract price will eventually deviate from future spot prices. Long term contracts at fixed prices are argued to provide supply reliability and stable prices. However, spot and futures market prices are economically efficient and the spot market is sufficiently developed to provide reliable supplies. The regulatory issue is which mix of spot and forward price contracts should be allowed by regulators. In an economically efficient market, consumers would be able to reveal their preferences and have them realized by a menu of choices. A regulatory solution is inherently inefficient because contracts signed by utilities and judged prudent by regulators cannot meet the individual preferences of ultimate customers. The prudence review of regulation cannot be an efficient substitute for customer revealed preferences. The only way to "allow" fuel purchasing contracts to reflect the interest of customers is to allow ultimate customers to make their own choices. An economically efficient solution to the contracts issue requires that customers have choices between contractual terms.

Two goals of national energy policy are to obtain reliable energy supplies and an economically efficient supply of energy. A third goal that relates to energy supply and demand is environmental quality. These goals imply that new power plants should be constructed when they contribute to an economically efficient supply of electricity, reliable

(and safe) supplies of power and reflect environmental costs. New power plant construction should compete with demand reduction efforts to determine the most efficient supply of energy services. The rationale of regulations requiring IRP is that a utility should assess demand and supply options on a "level playing field" and determine the least cost supply of energy services. The contention of this paper is that cost of service regulation for the construction of new power plants is unnecessary and extending these regulations to IRP perpetuates a regulatory inefficiency. These policy goals imply that ultimate customers be supplied with gas and electricity at an economically efficient price. Customers should also receive the appropriate market signals to determine their efficient use of gas.

IRPs by electric and gas utilities and long term fixed price contracts contain the strong probability of enormous costs, risks and inefficiencies. Business decisions involving billions of dollars are being made by utility executives that are not subject to a market test, but to a regulatory test in the form of a prudence review. As explained in Section 2, there is no market failure that justifies regulation in the form of requiring utility energy conservation plans, or, in the approval of long term contracts. Section 3 explains that regulation introduces a market failure by creating a bias towards supplying energy and discriminating against conservation measures. As developed in Section 4, under current cost-of-service regulation, utility programs designed to save energy can "crowd-out" private efforts to provide an economically efficient supply of energy services. Another regulatory inefficiency is the principal agent problem, which results in inefficient investments becoming highly probable and the costs becoming magnified by regulations. Some specific inefficiencies of IRPs and long term contracts are the following: (1) The costs and risks of program failures are borne by ratepayers, not stockholders, and not as a result of ratepayer decisions. (2) Cost of service regulation offers inadequate incentives to reduce costs and to make efficient business decisions. The risks of failed policies are therefore higher than in unregulated markets. (3) The diverse preferences of ultimate customers to purchase fuel and energy services cannot possibly be reflected by a franchise monopolist making business decisions that are approved by regulators.

Utilities have historically shown a preference for long term fixed price contracts. Approval of such contracts by regulators can introduce a regulatory failure in the form of the principal agent problem, because such contracts are not necessarily in the interest of ultimate customers. Section 6 reviews the "contracts problem" and its relationship to the principal agent problem in a regulatory environment.

The inefficiencies inherent in both IRPs and fixed price contracts can be eliminated by limiting the scope of cost-of-service regulation to the distribution of gas, the distribution of electricity and to the current capital stock of generating capacity. Gas should be purchased and sold to ultimate customers by competitive merchants, including local distribution companies (LDCs), with open access to LDC pipelines. Regulation in the form of public utility commission (PUC) approval of natural gas contracts would not be required. New generating capacity should be added by competitive procurement and new capacity should compete with conservation measures to meet the demand for energy services. (4)

The costs of IRPs, by both gas and electric utilities should not be an allowable cost and should not be charged to ratepayers. (5) Energy efficiency programs should be developed and sold by energy service companies and compete directly with suppliers of gas or electricity.

This proposal would, in effect, abolish integrated resource planning by utilities and the cost of service regulation for the purchase of natural gas and for investments in new additions to electricity generating. The proposal departs significantly from current utility regulation. However, if utility regulations were designed with the objective of allocating resources efficiently, new capacity, energy services and fuel purchases would not be subject to regulation. Current regulations of gas purchases and sales, the generation of electricity and integrated resource planning have no basis in the failure of markets to provide an efficient supply of these goods and services. Conservationists argue that current utility regulations distort resources in favor of building more power plants and supplying more energy. They argue that IRP by electric and gas utilities are more cost effective in meeting national energy needs. Perpetuating regulatory inefficiencies to include IRPs is not an effective policy model. Instead, regulatory inefficiencies that apply to each endeavor could be eliminated if market processes would be allowed to determine the least cost way to meet the demand for energy services.

2. MARKET FAILURES

Although national economic policies have apparently different objectives, such as price stability, full employment and an adequate supply of housing and energy, the two overriding objectives of *efficiency* and *equity* reflect other goals. For more than two centuries economists have been concerned with the conditions under which Adam Smith's invisible hand guides market forces to achieve an economically efficient and equitable allocation of resources. Given some restrictive assumptions about market conditions, private markets will tend to achieve an efficient allocation of resources. Efficiency is defined as Pareto optimal if no individuals economic welfare can be improved without making someone else worse off. In non-economic terms, economic efficiency ensures the highest possible standard of living and rate of economic growth, given the initial resource endowment and its distribution. The basic premise of economic policy analysis is that policies should attempt to achieve an efficient allocation of resources. There is significant doubt whether conservation policies that focus on saving energy or improving energy efficiency have this same objective (Sutherland, 1993c).

The appropriate basis of government regulation is the failure of private markets to behave efficiently. As stated by Spulber (1989, p. 1) "Thus the study of regulation requires a framework for analyzing the conditions of market failure." If a market is inherently efficient - that is, not characterized by a market failure - the appropriate Government policy is to allow competitive conditions to prevail. Certainly there is no argument for producing or distributing a good under cost-of-service regulation if the good could otherwise be produced and distributed under competitive conditions. Gas and electric utilities have been regulated for many years and this regulation has been based on a perceived market failure.

The need for utility regulation was apparently first recognized by John Stuart Mill in the mid-1800s. J.S. Mill noted that an inefficiency would result if several competing (manufactured) gas firms had there own set of pipelines under the city streets. Instead, gas could be distributed more efficiently by one set of pipelines where the distribution pipeline was subject to regulation.

The particular market failure recognized by Mill, that is now commonly accepted, is termed "natural monopoly", or, increasing returns to scale. A single firm distributing gas or electricity has a natural monopoly in distribution because technically it can have lower average costs than if the market were divided up into a number of smaller competing firms. Local gas distribution companies have, to this day, a natural monopoly in the distribution of gas. Electric utilities, with their extensive distribution systems, have a natural monopoly in distributing electricity. This natural monopoly is the market failure that is an appropriate consideration for regulation.

In addition to distributing electricity and gas, the utilities generate electricity and purchase gas. There is no market failure involved in the purchase of gas; certainly it is not characterized by natural monopoly. The absence of natural monopoly is even more apparent in the present market than a decade ago, because the current market has a highly developed spot and futures market where any participant can buy or sell at the current market price. At present, LDCs purchase and distribute gas. The market failure - the natural monopoly - implies that LDC should franchise rights and obligations should be limited to constructing and operating pipelines. However, gas could be purchased and sold to individual customers by competitive gas merchants. The successful unbundling of interstate gas transmission lines and the prompt development of a gas marketing industry implies that competition could also succeed at the distribution level.

Prior to about the early 1980s, electric utilities were considered to have a natural monopoly in the generation of electricity as well as its distribution. Power plant engineers asserted that doubling the size of a generating plant would less than double its cost. This rationale served to justify the continuing increasing size of nuclear plants from about 300MW characterizing the early vintage models to more than 1000MW characterizing the latest vintage plants. The engineers may have been technically correct, but their advice was a financial and economic disaster, as construction costs escalated, lead times lengthened and huge interest charges during construction were accrued. When the economic factors of power plant construction exposed the engineering calculations as being incomplete, the natural monopoly perception of large power plants disappeared. The current view is that no significant economies of scale characterize electricity generation. There is no other market failure that requires government regulation in the construction of new power plants.

The trend in new generating capacity is towards non-utility generators and independent power producers. The Public Utility Regulatory Policy Act (PURPA) of 1978 encouraged the development of cogenerators and small power producers to sell capacity and/or energy to electric utilities on a contractual basis. The market for non-utility

generation has subsequently grown to include independent power producers, who sell energy and/or capacity to electric utilities on a contractual basis, but who do not meet the stringent qualifying terms of PURPA. Of the electricity capacity added since the mid 1980s, more than one half has been from non-electric utilities.

There is no longer a theoretical or a priori reason to believe in economies of scale in electricity generation. Empirical evidence in the form of a developing competitive market also negates the perception of natural monopoly in electricity generation. There exists no apparent market failure in the market for new electricity capacity to justify construction by franchise monopolist with cost of service regulation. Gas pressure needs to be maintained on a distribution network and electricity generation needs to be dispatched. However, neither of these requirements precludes more free entry into the generation business, nor the opportunity to have contract choices.

3. REGULATORY FAILURE

Electric and gas utilities are developing and implementing demand side management plans (DSM) that are being required by public utility commissions (PUC). The National Energy Policy Act of 1992 requires electric and gas utilities to file IRP with their utility commissions. One objective of DSM programs is to reduce the need for new power plants and thereby provide energy services at least cost. The regulatory treatment of DSM programs is the same as that of power plant construction; costs of DSM are being approved under cost-of-service regulation as long as they are judged to be prudent. There is no market failure that requires electric and gas utilities to spend billions of dollars in an effort to decrease the demand for their own product.

The underlying theory of conservation policies is not well-grounded in terms of the failure of private markets to allocate resources (Sutherland, 1993). Instead, conservation policies appear to be justified in terms of market barriers that discourage private markets from achieving the desired level of investment in energy efficiency. The perceived need for utility regulation in the form of integrated resource planning (IRP) and particularly the need for DSM programs is only partially defined in terms the market barriers that characterize energy efficiency investments. Because of apparent market barriers, private markets, without additional incentives, will not undertake the level of conservation investments that conservation advocates consider to be cost-effective.

Conservation advocates complain that utility regulation imparts a significant bias in the supply decisions made by utilities to meet future energy demand. Under the regulatory bargain, utilities have an obligation to serve within their service territory, but they are granted a franchise monopoly to serve. Utilities receive an allowable rate of return to construct and operate power plants, as long as these costs are considered prudently incurred under cost-of-service regulation. Utilities therefore have an incentive to meet the need for energy services by constructing new plants. In contrast, under traditional regulation, utilities have no incentive to supply energy conservation, because such endeavors increase costs and reduce revenues. The regulatory system imparts a bias in the form of constructing new

power plants and supplying more energy than would occur in a competitive market. The costs of new capacity are less than they would be under competition because some of the investment costs and risks are shifted to ratepayers. A regulated franchise monopoly has a subsidized cost of capital because ordinary costs and risks are shifted to ratepayers. As explained by Reid (1992) a critical development in the evolution of utility DSM programs was the acceptance by the National Association of Regulatory Utility Commissioners (NERUC) of a proposal whereby utilities would obtain for DSM programs: a cost recovery from ratepayers, compensation for lost revenues and a bonus provision "...that would help offset the risks that utilities often perceive in DSM.." (p. 25). That is, the success of DSM requires that the costs and risks incurred by ordinary businesses be shifted to ratepayers. To restate, two specific regulatory failures are the artificially low cost of capital paid by utilities because of the regulatory bargain and the bias against supplying energy conservation.

The solution of the conservation community to these regulatory inefficiencies is to require electric and gas utilities to design and implement IRP and to extend cost of service regulation to "allow" the costs of such plans to be paid by ratepayers. If the costs of new construction and of energy conservation efforts were each allowable under regulation, a level playing field would presumably be created a "least-cost" supply of energy services would be attained.

Regulations requiring IRP by utilities are not a response to a market failure, but to a regulatory failure that encourages building. However, there is no market failure justifying the construction of power plants by regulated monopolists. This activity could well be conducted by competitive procurement, which has been the trend for more than one decade. If new construction were done competitively, there would be no regulatory failure requiring that utilities be in the business of reducing the demand for their product.

This discussion of market failures applies to gas utilities as well as to electric utilities. Gas utilities, termed local distribution companies (LDC) are franchised monopolies that purchase gas on the open market and distribute it to ultimate customers. The functions of LDCs can be thought of separately as the purchase and sale of gas and its distribution through pipelines. As noted above, the distribution of gas can most efficiently be conducted by a single set of pipelines, rather than a multiple set of pipelines located under the same streets. The natural monopoly argument applies to the distribution of gas and supports the need for a single distribution company.

There is no market failure applying to the purchase of natural gas. Indeed, gas is now sold extensively on regional spot markets where a large number of purchasers can participate. Approximately 300 gas marketing firms are in the business of purchasing and selling gas contracts and such firms could sell gas to ultimate customers. If gas marketing firms sold gas to ultimate customers, they could just as well contract for gas services to ultimate customers. There is no reason for LDCs to develop programs to reduce the demand for gas under cost-of-service regulation. LDCs can transport gas from the city-gate

to ultimate customers and receive a rate of return on their investments in pipelines. However, with open access to LDC pipelines, gas marketing firms could efficiently supply gas and gas services to ultimate customers.

Although the appropriate role for regulation clearly derives from market failures, there are no market failures that justify DSM efforts by either electric or gas utilities. Instead, such mandated programs are justified by a regulatory failure that encourages energy supply additions instead of conservation measures. Undertaking DSM in a regulatory environment does not improve efficiency with which resources are allocated, instead it perpetuates an inefficient system. A preferred alternative is to abolish cost-of-service regulation where it is not justified, such as the purchase of gas and the construction of new power plants.

4. THE CROWDING-OUT EFFECT

The National Energy Policy Act of 1992 (pages 15 and 17) requires consideration of the impact that electric and gas utility DSM programs have on small businesses that provide energy services. An inherent characteristic of regulatory treatment towards utility DSM programs is that such programs necessarily discriminate unfairly and inefficiently against small businesses. Private firms that supply conservation are discriminated against in the market, because they have to recover the full costs of the product they supply, whereas cost of service regulation subsidizes new construction because it makes ratepayers bear costs and risks that would not occur under competitive conditions. In private markets, small (and large) businesses must recover the full costs for the goods and services they provide by the price of the good. Customers thereby pay the full cost of the goods and services they purchase. Under utility regulation affecting DSM programs, participants pay only a share of the cost and another share is paid by ratepayers. This price distortion necessarily discriminates against (small) businesses that contribute to the economically efficient use of energy. A small business in a competitive market has little opportunity to compete successfully with subsidized monopolists.

Under existing utility regulation, utility programs targeted at energy efficiency tend to "crowd-out" private efforts to provide an economically efficient level of energy services. To illustrate the crowding-out effect of utility DSM subsidizes, suppose that a small business develops an energy efficient incandescent light bulb that reduces operating (and life-cycle) costs relative to existing light bulbs. This technological development enhances economic efficiency as well as the efficiency of energy services. Over time, this technology would be diffused into the marketplace and would achieve a significant market share. Assume also that the local utility has a DSM program that includes the subsidization of fluorescent light bulbs at a fraction of the retail cost. In some programs, the utility pays rebates to those customers who purchase the fluorescent light bulb. The cost of these bulbs not paid by participants is recovered from ratepayers. The effective retail price of fluorescent light bulbs is less than total costs. One inefficiency is that small businesses have diminished incentive to develop a more efficient light bulb, because of the unfair price competition from the local utility. If the firm develops the bulb, it faces unfair competition in selling it,

because of the price distortion caused by regulation. A firm that must recover the full cost of its product is inherently disadvantaged if it competes with a firm that only recovers a share of its costs from participants.

One cost of crowding-out of small businesses by subsidized utility DSM programs is that such businesses are adversely affected. This cost is the explicit concern expressed in the 1992 National Energy Policy Act. The more serious cost is the misallocation of resources. The economically efficient purchase is the incandescent light bulb, where the price of the light bulb equals its costs and benefits at the margin. However, this purchase is not made. Instead, an inefficient purchase is made where the price is lower than its cost and consumers are encouraged to use the light bulb, e.g., in garages or closets, where its value is less than its true cost.

The crowding-out effect that inefficiently discriminates against small-businesses and other private sector efforts to supply energy efficient services would be eliminated if utility programs required participants to pay the full cost of programs. Customers who buy fluorescent light bulbs should pay the full cost of these bulbs, including the cost of utility efforts to encourage their purchase. The economically efficient level of utilization of fluorescent and incandescent light bulbs would result if each were priced according to their marginal costs. This pricing would also eliminate unfair discrimination against small businesses.

Conservation advocates generally oppose requiring customers to pay the full costs conservation measures. Moskowitz (1992, p. 15) articulates the position of the conservationist when he asserts that the primary risk of having customers pay the costs of DSM programs "...is that participation rates may suffer." (p. 15). This statement provides an insight into a fundamental difference between conservationists and economists. Economists are concerned primarily with economic efficiency, which can often be obtained by removing price distortions or other market imperfections. Conservationists generally advocate energy efficiency and this can only be achieved by encouraging participation in programs designed to achieve energy efficiency. Private markets have inherent incentives to allocate resources efficiently, but they have no incentives to reduce energy consumption. As I have explained elsewhere (Sutherland 1993), there is no connection between energy efficiency and the efficient use of energy resources. If the goal of economic efficiency were accepted along with the necessity of efficient pricing, there would be no need for utilities to be involved in energy demand reduction efforts. In fact, such efforts could more effectively be developed by competitors to utilities.

A crowding-out effect of electric utility conservation programs is the displacement of economically efficient gas technologies. As a result of electric utility conservation programs, participants are able to purchase energy efficient electricity technologies at subsidized prices. If the electricity technology is subsidized, while the gas technology is priced at full cost, customer choices are distorted and resources are misallocated. The misallocation is that economically efficient gas technologies are crowded out of the market

by subsidized electricity technologies. The solution to this problem that is emerging is to require gas utilities to develop IRP and subsidize gas technologies to compete with electric utilities.

5. REGULATION AND THE PRINCIPAL AGENT PROBLEM

A market inefficiency results when an individual (principal) retains an agent to act on his or her behalf and the agent, who has his own objectives, does not efficiently represent the principal. Examples are numerous: the surgeon who recommends unneeded surgery, the insurance agent who recommends excessive insurance, the repair person who recommends unneeded repairs. The agent is compensated to supply information and has a financial stake in the information provided. The principal agent problem leads to economically inefficient decisions.

The costs resulting from the principal agent problem are likely to be greater in regulated industries than in non-regulated industries. The "capture" theory of regulation argues that regulated firms are able to exercise considerable influence over their regulators. To the extent that this view is correct, the principal agent problem is more likely to arise in regulated industries than in competitive industries. When the principal agent problem occurs, it is also more likely to be severe in regulated industries. In the case of the surgeon, the insurance agent, and the repair person, the principal has the option of obtaining a second opinion. Obtaining additional information may be expensive, but it serves as a market check to limit the inefficiency of the agent problem. If an unfortunate business decision is made, the principal can at least discover the mistake and conduct subsequent business elsewhere.

When utilities and the PUCs make decisions that do not reflect customer interests, customers have fewer options. As a result of the regulatory bargain, utilities are granted franchise monopolies within their service area and this serves to limit consumer choices. For instance, if utilities sign long term fixed price contracts to purchase gas and the price subsequently exceeds current market prices, customers either pay this price or switch fuels. Most end use customers have limited fuel switching capabilities other than replacing capital at the end of its useful life. As another example, in utility conservation programs, participants incur the benefits while non-participants pay the cost. As long as the regulatory system allows the ratepayers to subsidize participants, there is no market check on the net benefits of the program. There exists no market check on IRP programs - only a regulatory check where stockholders are compensated regardless of the effectiveness of the programs. Inefficiencies can continue indefinitely, regardless of the cost-effectiveness of the programs,

At least two of the most serious economic policy errors resulted from the principal agent problem under regulation. The two policy mistakes are the savings and loan crisis and nuclear power. In the S&L crisis, the managers who made the investment decisions did not represent the best interest of the principals (the depositors). The managers were in the position of experiencing potentially large gains from successful investments, but limited in their losses in the event of investment failures. Regulations of investments were relatively

lax as the industry was being deregulated. However, regulations of deposits were highly stringent in the sense that deposits, up to $50,000 per deposit, were guaranteed by the Federal Savings and Loan Association. The effect of regulations was to permit highly risky investments, but with a government guarantee to depositors. In the absence of government protection of deposits, depositors would have required more information about the quality of assets and managers would have been held accountable for their decisions.

The S&L managers had different incentives than their depositors, which is the principal agent problem. The magnitude of the crisis resulted from inefficient regulations that allowed potential profits to be enjoyed by the S&L owners and managers, but the risks of failure to be shifted to depositors. This inefficient allocation of risk encouraged much more risk taking by managers than would have been the case had they been held accountable by the depositors.

When investments are made in the private sector, the business managers are held accountable to the stockholders. Managers often receive financial incentives that are tied directly to the value of the stock. The incentives of managers, who make the investment decisions, and stockholders, who are affected by them, are made to correspond as closely as possible. A serious inefficiency results in a regulatory environment when the costs and risks of normal business investments are shifted unknowingly to ratepayers who have no recourse.

Critics of IRPs have recognized some similarities between utility conservation programs and nuclear power. Superficial comparisons are obvious: nuclear power promised electricity "too cheap to meter" and conservationists recommend "negawatts not megawatts" Nuclear power advocates touted their programs as having enormous potential to solve the national energy problem. Conservationists make similar claims about the potential of energy efficiency. Wirtshafter (1992) provides a comparative analysis of the experience with nuclear power and the path that utility DSM programs are taking and notes numerous similarities. However, what needs to be recognized is that the primary causal variable that explains the magnitude and duration of the nuclear power disaster also characterizes IRPs and the regulatory approval of long term fixed price contracts.

A critical milestone in encouraging the purchase of nuclear power plants was the Price-Anderson Act, which limited the financial liability to utilities in the event of a nuclear accident. The liability for this risk had to be shifted away from utilities to attract their interest in nuclear power. In unregulated business, this risk would be borne by the firm and the cost would be reflected in an insurance premium. With the long lead time required to construct nuclear plants, utilities sought and sometimes received an allowance for construction work in progress. This regulatory action shifted the costs and risks of nuclear power investments to ratepayers and encouraged the construction of nuclear power. Investments by unregulated businesses are recovered by successfully competing in the marketplace.

The conditions that encouraged the development of nuclear power also characterize the growth of IRPs. Further, the conditions that facilitated the costly mistakes of nuclear power also characterize IRPs of both electric and gas utilities. First, to provide the sufficient incentives, the costs and risks of nuclear power had to be shifted to ratepayers. Similarly, the costs of IRPs are being considered by regulators as an allowable cost of service regardless of when and if the utility investments have their expected payoff. The costs of energy efficiency investments are borne by ratepayers, because an essential component of the programs is to provide incentives to invest in energy efficiency. The risks of the demand reducing programs are also shifted to ratepayers. If the IRP efforts to reduce demand fail to have their expected effect, ratepayers pay first for the IRP programs and secondly for the construction of new power plants. In contrast, stockholders always benefit by from IRPs because the costs are an allowable cost of service and if the IRPs fail, the stockholders obtain additional benefits in the form of an allowable rate of return on the required new power plants. The regulatory environment that shifts the costs and risks of IRPs to ratepayers, facilitates investments that could be costly failures. As a result of regulation, these costs will be borne by ratepayers and not by stockholders, which would be characteristic of investments by unregulated businesses.

The magnitude of the costs of nuclear power are a consequence of the regulatory protection in the form of the prudence review. As long as these costs were judged prudent and entered into ratebase, the utilities had no incentive to reduce their nuclear programs. Had nuclear power been subject to a market test instead of a regulatory test, the programs would have been terminated much sooner. Similarly with utility DSM programs; the actual costs may be much high than utility accounting efforts indicate (Joskow, 1992) and benefits much lower (Nichols, 1992); however, market tests are not imposed to estimate either costs or benefits. Until ratepayers revolt, as they did in nuclear power, inefficiencies can be perpetuated indefinitely.

6. CONTRACTS WITH REGULATED UTILITIES

Electric and gas utilities have historically purchased fuel under long term contracts at relatively fixed prices. The issues involved in utility conservation programs - market failure, regulatory failure, crowding-out and the principal agent problem - also apply to fuel procurement under regulation. The regulated firms include LDCs, electric utilities and independent power producers who provide electricity to utilities under contract. The fuel of particular interest is natural gas, but electric utilities also purchase coal under long term contracts. The costs of purchasing gas and coal are recoverable through retail prices if utility commissioners judge them to be prudently incurred.

Gas and electric utilities may each prefer long term contracts and with a fixed price. Utility commissions may have an incentive to allow such contracts, even when they reduce economic efficiency and are not in the interest of the ratepayer. The approval of fixed price fuel purchasing contracts by utility commissions may reflect a market failure in the form of a principal agent problem. The problem arises when long term contracts are in the interest of utilities and PUCs, but not in the interest of ratepayers. Utilities have an interest in long

term stable prices if the costs are automatically passed through to customers. The benefit of fixed prices to customers is dubious, especially when such prices reflect a premium above spot and when such prices are imposed upon customers without a choice.

The fuel purchasing agent of an electric or gas utility may have different incentives from his customers. For example, the purchasing agent may prefer long term contracts, either at fixed prices or at a premium over spot prices. A successful transaction meets the responsibilities of the fuel purchasing agent because reliable supplies have been obtained. If the terms of the contract are accepted by the utility commissions, the agent has avoided the risks of cost disallowance. The agent has the primary incentive to obtain reliable supplies and to avoid risk of disallowance by the commissioners.

If fuel prices turn out to be economically inefficient, the agent does not pay for that inefficiency, rather it is the ratepayer. If fuel prices subsequently fall, and customers could have had lower spot prices, the customers fail to benefit. A fixed price contract shifts the risk of inefficient fuel prices to customers, whereas the fuel purchasing agent makes the decision. A utility contract to purchase fuel at spot prices plus a premium also illustrates the inefficiency described by the principal agent problem. The appeal to the purchasing agent is that such a contract is easier to negotiate than frequent spot purchases. The cost of the premium is borne by ratepayers in the form of excessive fuel costs.[2]

The literature on contracts indicates that the duration of contracts is selected so as to minimize transactions costs between buyers and sellers. An additional hypothesis is that regulation imparts a bias in efficient contracting by encouraging contracts of extremely long duration. Long term contracts of 10 and 20 years are observed primarily in regulated firms, such as utilities purchasing gas and coal. Industries with a similar degree of asset specificity such as the newspaper publishing and petrochemicals (Palmer, 1991) are characterized by contracts that rarely exceeded five years duration. The principal agent problem suggests that regulated firms may prefer longer term contracts than unregulated firms. The extended duration may appear to provide reliability and security to the regulated firm. When long term contracts contain fixed prices, the risks of inefficient prices are shifted to customers if the contracts are judged prudent by regulators (Sutherland, 1993a). The regulatory bias in favor of long term contracts with non-market based prices probably results in transactions occurring at economically inefficient prices over a long period of time.

Ultimate gas customers certainly have a variation in preferences. Some customers prefer only spot purchases. Other customers prefer a portfolio of spot and forward

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[2]Lemon (1990) considers various gas supply portfolios characterized by the average price of gas and the risk of under-recovery by regulation. Lemon notes that a portfolio that reduces the average cost of gas but increases the exposure of the utility to regulatory risk may not be in the utility's self interest because it does not profit from lower prices.

contracts. Still other customers may prefer to vary the quality of their service by purchasing interruptible gas at reduced rates. Another likely preference is the ability to purchase energy efficient gas technologies, which could be part of a gas service contract. Regulated utilities have different preferences from their customers and do not offer customers this menu of choices. As long as regulators reflect utility interests and allow utilities to sign fixed price contracts, the costs of the agent problem are being increased by regulation. The inefficiencies due to regulation are more serious than merely the principal agent problem.

If ultimate gas customers were able to purchase gas under competitive market conditions, they could obtain the contract terms of their choice. The only way to allow contract terms to reflect customer choices is to let the customer make the choices and not the regulator or the utility. If a utility purchases a share of its portfolio under forward prices and the remainder under spot prices, this portfolio is not likely to reflect the interest of any of its customers. Each customer purchases gas from the utility under the same terms. Those customers who prefer only spot purchases will not have their preferences reflected. Similarly, those customers who prefer forward prices will also be forced to purchase gas under terms not of their own choosing. Economic efficiency can only be obtained if individual customers make their own choices. A franchise monopoly cannot make these choices for customers and regulators can never determine the contractual terms that are economically efficient for individual customers.

There exists no market failure that justifies the purchase of fuel by regulated and franchised monopolies.[3] The principal agent problem, which is magnified by regulation, argues that such a purchasing system be replaced by competition. Competitive merchants should have open access to LDC pipelines and be free to contract directly with ultimate gas customers. Customers would have a menu of choices and thereby be able to contract for gas as they prefer. A market with competitive merchants would automatically solve the principal agent problem because gas merchants would have to offer customers contracts that reflected customer interests. If gas merchants could contract for gas, they could also sell energy efficient gas technologies directly to end users. Furthermore, competitive merchants would have appropriate incentives to provide least cost energy services.

Two additional issues in utility purchases of fuel are incentive regulation and the fuel adjustment clause. The idea of incentive regulation is to give utilities an incentive to purchase fuel at a minimum cost. The issue of the fuel adjustment clause is whether the purchased cost of fuel should automatically be passed on to customers. These issues have been subject to extensive debate, but not to a resolution. If competitive merchants had access to LDC pipelines, these two issues would be solved automatically. Fuel purchasing incentives and a fuel adjustment clause would become superfluous.

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[3] Regulated distribution companies have a transaction cost advantage over competitive energy service companies because of access to customers through monthly utility bills. Sharing arrangements are feasible in energy utilities, just as they are in telecommunications.

7. SUMMARY

The historical justification for the regulation of electric and gas utilities - the natural monopoly argument - applies primarily to the distribution of gas and electricity. There is no market failure to justify the purchase of gas, the construction of new generation facilities, or, the supply of conservation measures. Furthermore, cost-of-service regulation imparts a regulatory failure, where the costs of inefficiencies become magnified by the principal agent problem. Cost-of-service regulation of generation discriminates against private sector efforts to conserve electricity. Consequently, cost-of-service regulation was extended to require utilities to undertake conservation measures. Electric utilities use ratepayer funds to subsidize the purchase of energy efficient electricity using technologies. Distorting the price of electricity technologies introduces discrimination against gas technologies that could be more economically efficient. The regulatory solution has been to extend the IRP process to gas utilities and encourage these utilities to subsidize the purchase of energy efficient gas technologies. The story is one of unnecessary and inefficient regulations being used to remedy inefficiencies that were themselves created by unnecessary and inefficient regulations.

A similar scenario describes the regulation of the purchase of gas by gas utilities. The natural monopoly of gas distribution was unnecessarily extended to gas purchases under contract. Gas purchases by utilities that are judged allowable by regulators cannot match the preferences of individual ultimate customers. Economic efficiency would be enhanced by allowing gas merchants to sell gas directly to ultimate customers, where a wide range of price, reliability and energy conservation options would best meet customer preferences.

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