WHY PRICE CONTROLS WON'T WORK IN CALIFORNIA

A WHITE PAPER PREPARED BY DYNEGY INC.

> *One of the problems with wage and price controls is that economic decisions suddenly become political decisions. People perceive that policy-makers are making decisions about wages and prices, so they rush in to lobby the policy-makers. Then the politicians get involved. Imposing controls politicizes what should be a non-political or economic process – the allocation of resources in the economy. One of the worst consequences is that the entrepreneur spends all of his time trying to figure out how to manipulate the controls in order to make a profit instead of trying to figure out how to build a better mousetrap and outcompete his competitors.*
>
> *Vice President Richard Cheney*[1]

Price controls discourage the very actions that are required to reallocate scarce resources and establish a balance between supply and demand. They mask necessary price signals.

The purpose of this White Paper is to explore the ramifications of price controls and, in particular, how they will undermine reliability of electric service in both the short and long-term.

The White Paper will first provide a brief background on California and how we got to where we are now. In attempting to answer the question: "are price caps the answer?" the White Paper will provide some historical context on price controls and will explain the difficulties associated with implementing price controls. These include the need to:

- create what will ultimately be very complicated pricing mechanisms;
- allocate various electricity products, e.g., capacity, energy, and ancillary services, when they become scarce;
- regulate what is now unregulated generation, e.g., generation owned by municipal, cooperative and federal power agencies; and
- deal with unintended "upstream consequences," e.g., higher emissions allowance credits and natural gas costs.

The White Paper's conclusion is that price caps will make today's problems worse and their correction at some later date more painful.

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[1] In a 1993 interview, Policy Review, Summer 1993, Published by the Heritage Foundation.

CALIFORNIA BACKGROUND

From "buy low, sell high" . . .

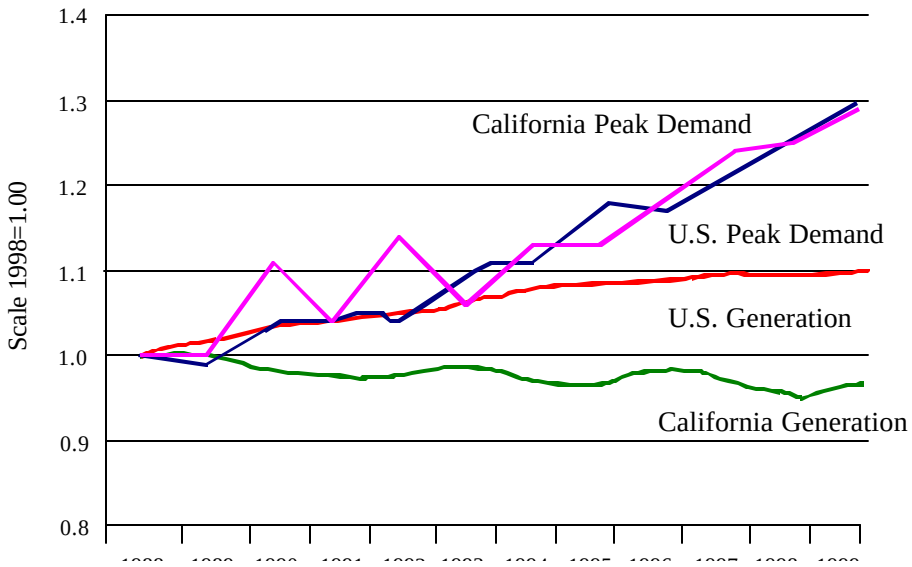
In 1996, when the State of California modified its regulation of the retail electric power industry, market-based wholesale prices were far below the State-imposed 6.5 cents/kWh cap on retail sales. The expectation was that the utilities would purchase power at these low, market-based prices and resell the power to consumers at a much higher, regulated price. The regulated retail price was to be fixed until the utilities had harvested an amount on these resales sufficient to recover specified costs they were expected to incur. These were known as "stranded costs" and were the result of other aspects of the revised regulatory scheme. This strategy worked for a while: Wholesale prices hovered around 3.5 cents per kwh while the utilities were allowed to bill consumers around 6.5 cents per kwh, allowing the California IOUs to reap $16.8 billion in stranded cost collections through last October.

This "buy low, sell high" strategy presupposed that the regulated retail price would remain significantly above the market-based wholesale rate during the entire 5- to 7-year period during which the utilities were recovering stranded costs.

. . . . to "buy high, sell low"

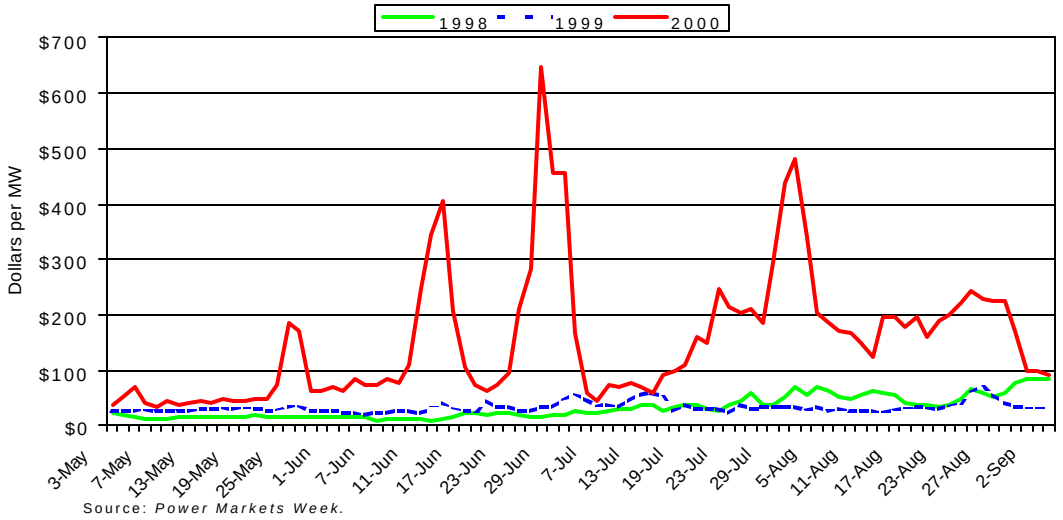
However, as the new regulatory rules were put in place, the growing economy in the western United States led to an increase in the demand for electric power that was not matched by a commensurate increase in supply. The failure of supply to keep pace with demand was due to a number of factors that have been detailed elsewhere, but included (a) uncertainty as to the economics of new power plant investment, largely the result of ongoing and ever-changing price caps; and (b) difficulty in siting and permitting new power generation and transmission projects, especially within California. Adding to the problems were (c) artificially inflated demand, the result of legislatively pricing power at retail below the cost of incremental supply; and (d) a significant decline in precipitation in the Pacific Northwest (cutting into the availability of hydroelectric resources).

Since 1998, California Demand Up 28% and California Supply Down 4%.

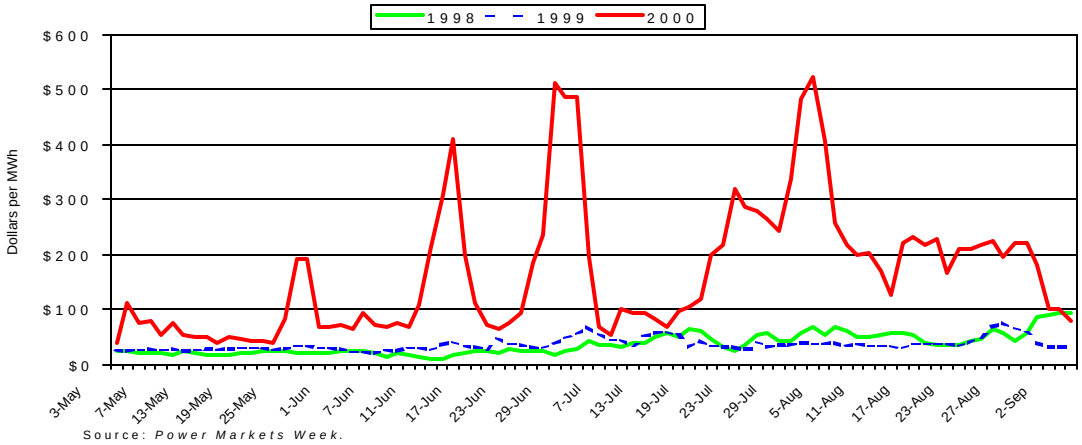


The failure of power supplies to keep up with demand led to escalating prices, beginning in short spurts as early as 1998, as buyers throughout the region bid up prices from time to time in the wholesale market.

Bilateral Index Prices at COB



Bilateral index Prices at Palo Verde



In California, where retail prices were capped for a period of years, the escalating wholesale price eventually rose on a sustained basis above the fixed retail price, putting the utilities in the position of "buying high and selling low." The situation was seriously compounded by the regulatory inability of the utilities to enter into long-term, defined-price *purchase* contracts to match their long-term fixed price *sales* obligations under the price freeze. In addition, the role of the ISO in purchasing power in the real-time markets

for reliability purposes essentially put the procurement personnel in the position of being told that they *must* buy a defined amount of power without regard to price while using someone else's money (*i.e.* the utilities'). This, of course, was a scenario remarkably ill-suited to robust competitive bargaining.

By the late summer of 2000, the policy of buying at prices far in excess of the fixed resale price began to place unprecedented financial strains on the ability of the California utilities to meet their various payment obligations, precipitating a crisis-like situation throughout the West.

ANALYSIS

Rationing by rules versus rationing by price

Faced with the shortage of electricity supply available to consumers in California, there are fundamentally only two ways to allocate scarce supplies at wholesale: by regulatory/administrative rules; or by price. Both approaches ration scarce supplies. But the two approaches have distinctly different consequences.

- ***Rationing by price***

Rationing by price allocates the available supplies to the highest valued uses by providing powerful incentives both to buyers to reduce their purchases and to suppliers to bring new supplies into the market. Long-term, these new supply sources will consist of new generating facilities as well as new transmission capacity to bring more of the existing generating from where it is located to where it is needed (particularly in Northern California). Notably, however, rationing by price also allows for very short-term adjustments, as was seen this winter when some out-of-state industrial users chose to suspend production operations because the power was more highly valued in California. By shutting down production, they were able to quickly free up supplies for California. While rationing wholesale supplies by price does not guarantee that there will not be planned retail power outages (i.e., rolling blackouts), it sharply reduces the risk of such events.

- ***Price caps inevitably lead to rationing by rule***

Trying to repeal the laws of supply and demand, e.g., by imposing price caps, is like squeezing a balloon: the more one squeezes the more things tend to pop out elsewhere. In California, for example, when the ISO imposed price caps on the real-time market, the day-ahead market reacted by underbidding, shifting sales to the real-time market. In other words, why gamble on the price in the day-ahead market, when you know for sure what the price will be in the real time market.

In like fashion, imposing controls on prices will inevitably require the imposition of rationing by rule. Assuming that the price set by regulation is below the level that would otherwise prevail, then supply will by definition fall short of demand for power at that

price. This means that the administrator of the wholesale transmission grid will have to allocate the available supplies among its customers, principally the major utilities. This, of course, is what has been happening in California over the last few months as the ISO allocates supplies and notifies the utilities when supplies are so low as to trigger a power alert and to interrupt through prior contractual agreement. Ultimately, rationing by rule means imposition of rolling blackouts, which is merely a form of forcing consumers to "stand in line" to wait to get their share of the available supplies. Planned, rolling blackouts are thus no different from an economic perspective than the cars lined up at gas stations in 1973 and 1979 when price controls on gasoline required rationing by rule of that form of energy.

While rationing by rule does ensure balance between supply and demand (by reducing demand to match available supply), it does not provide any immediate incentive for consumers to consume less, since the profligate consumer incurs no greater penalty for not reducing consumption than the civic-minded one: there is no link between the actions of a particular consumer and the quality or continuity of service – both are equally subject to rolling blackouts. There is an important *indirect* incentive to reduce consumption, however: The threat of unreliable retail power services encourages businesses that depend on reliable service to shift production to other areas that provide more reliable power services (whether to other states or, indeed, to other countries).

Notably, a shift to manufacturing outside the United States due to price caps could easily include the manufacturing of power. For example, on February 21, 2001, Sempra Energy Resources announced plans to build a 600 MW gas-fired plant in Mexico, outside the reach of FERC or ISO price caps. Ironically, Sempra is a strong proponent of regional price caps in the United States.

Perhaps most significantly, however, under rationing by rule, there is a direct and affirmative incentive for suppliers to redirect supplies *away* from the capped market to higher valued uses. Hence, instead of out-of-state industrial users cutting back their consumption to make more energy available to California, the out-of-state users will be able to outbid California's lower bids, attracting more supplies out-of-state, thereby exacerbating the shortage within the state. This has already happened in western markets.

While a West-wide price cap may help California avoid this situation in the short term, it will only make the challenge of rationing by rule more daunting due to the increased geographic scope that must be policed and the potential for jurisdictional squabbles. In addition, with limited turbines available for new generation worldwide, it is likely to push not only industry and jobs, but also new generation outside the West, and perhaps outside the United States.

PRICE CONTROLS: HAVE THEY EVER WORKED?

Thirty years ago, on August 15, 1971 to be exact, President Richard Nixon in an attempt to combat inflation imposed wage and price controls. Wages and prices were frozen initially and then prices were later allowed to increase if companies could show that prices had also increased. Many observers are convinced that it was political rather than economic considerations that led to this policy. After all, the following year, 1972, was a presidential election year.

Were they successful? If one considers higher prices, artificial shortages, lack of capital investment, creation of large bureaucracies to administer controls to be measures of success, they were successful. Inflation fluctuated between 6 percent and 3.3 percent in the two years leading up to the 1971 price controls. In 1974, the inflation rate was 12 percent. The consumer price index grew at 5.7 percent in 1970 and, in 1974, was growing at 11 percent. It took 3½ pages of regulations to impose price controls but a few years later those few pages multiplied to 1,030 and then grew even more to 3,500 pages.

C. Jackson Grayson, the former chairman of the U.S. Price Commission in Nixon's administration had the following to say during a debate on President Clinton's failed health care plan: "Controls haven't worked for 40 centuries. They didn't work in 1971-1973 and they won't work now."[2] He also commented that price controls are extortionate because of "the cost it takes to enforce them, the cost it takes to comply with them and understand them and then the cost it takes to evade them."

The natural gas experience

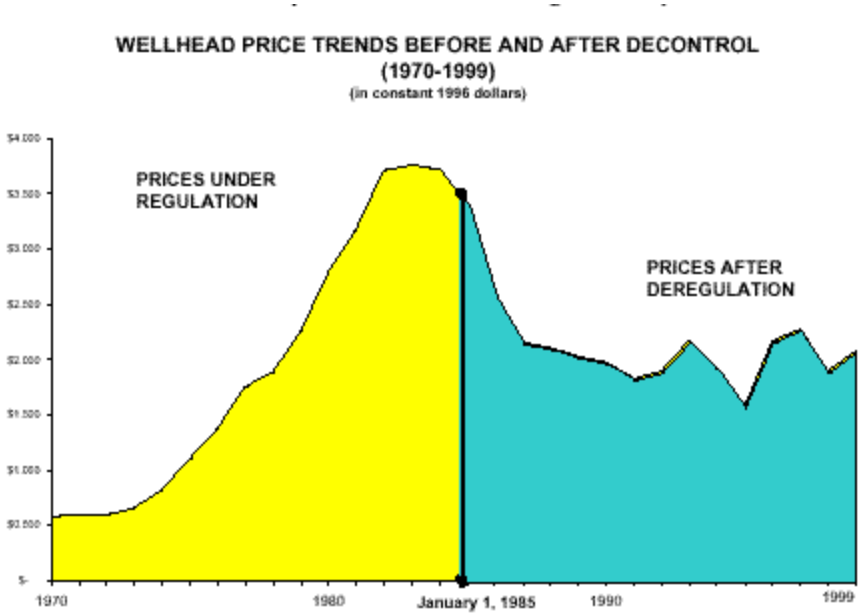
The Nation's experience with the price control regime for natural gas is instructive here as well. Ultimately that price control regime led to endemic, chronic shortages in interstate natural gas markets from the late 1960s through the 1970s. At that time, price controls on interstate sales drove new supplies into higher valued intrastate markets, exacerbating the interstate shortages. The shortages grew worse yearly until the emergency winter of 1976-77 when over a million workers were laid off by February of 1977 because interstate suppliers could not meet the needs of both residential and industrial users. When the US extended controls to the intrastate market in 1978, the price of gas imported from Canada and Algeria soared, with most of the increase going directly to the foreign governments as taxes, such that the extension of price controls to help the American consumer in effect simply turned into a tax collection mechanism for the benefit of other countries. (In this vein, BC Hydro was reportedly able to command high prices and favorable terms to sell to California during the winter of 2000-2001 and, as noted, Sempra is building generation in Mexico.) When Congress – in the Natural Gas Policy Act of 1978 (NGPA) – tried to "fine tune" 1950's-era price controls by creating two levels of pricing (high for "new gas" and low for "old") the result was a "feeding

[2] Business Insurance, Crain Communications, December 27, 1993.

frenzy" for the high-priced gas that ultimately created an even more costly *surplus* of gas, with billions upon billions of dollars in take-or-pay obligations (stranded costs) imposed on interstate pipelines. The same feeding frenzy will occur if FERC-jurisdictional power prices are capped while non-jurisdictional, *i.e.*, municipal, federal, state, cooperative, and foreign-sourced power is not.

Ultimately, restructuring of energy markets over the last 15 years is a direct result of the failure of the price control regime.

Perhaps most telling is the chart below, showing the "bottom line" effect of price controls over the 15 year period from 1970 to 1985 and the effect of their removal from 1985 to 1999. The price controls failed to control prices and merely brought shortages. Shortages, in turn, heightened demand, and, in turn, prices for unregulated gas.



Practical complications of imposing power price controls

Besides the above-described negative economic consequences, the imposition of price caps on interstate wholesales in the western United States would be extraordinarily complicated in practice. Indeed it would be far, far more complicated than the price controls on natural gas imposed by NGPA, for the simple reason that reliable electric power service, unlike natural gas, is not a single, raw commodity to which a single price limit can be assigned. Rather, it is a dynamic combination of distinct unbundled components.

These distinct service components exist because of the absolute requirement to maintain a near-simultaneous balance between supply and demand on the grid as well as the synchronization of the electric frequency of all supply sources feeding into it. Put another way, these engineering imperatives mean that wholesale electricity markets must allow for the right amount of a variety of "ancillary" services to be incorporated into the market at just the right times. In addition, any system of price controls would have to address the distinction between electric "capacity," which is the ability to generate a defined amount of power at any given time, and electric "energy," which is the amount of

power actually generated during a defined period of time. These points are discussed below.

- ***A Basic Primer on Differing Power Products:***

  - ***Megawatts ("capacity" to generate) vs Megawatthours ("energy" produced by capacity).***

Electric "capacity," measured in units such as watts, kilowatts or megawatts (MW), must be distinguished from electric "energy," measured in units such as watt-hours, kilowatt-hours, and megawatt-hours (MWh). The first is the ability to generate power; the second, the actual generation of that amount of power continuously over a defined period of time, typically an hour.

The retail price of electricity service in California, which has been the subject of much public debate in recent months, has been driven by the price of *energy*. This is because during the period of supply surplus leading up to the summer of 2000, California chose not to contract for significant amounts of capacity. As with most things in life, when supplies tighten and you have not paid to reserve capacity, the incremental purchase price rises, sometimes dramatically.

In a market where there can be scarcity, the normal reaction is to pay some fee to reserve capacity. In most wholesale power markets, customers purchase blocks of "capacity" – MW – separately from the actual energy (MWh). Capacity is typically billed monthly, regardless of usage. Hence, the actual *unit* cost of the electrical energy purchased in a given month is the sum of (a) the price per unit of energy purchased during the month *plus* (b) the amount paid that month for capacity *averaged over* the number of units of energy actually purchased.

The ultimate unit price for power depends on the particular buyer's purchase pattern under that particular contract: a buyer that purchases a single MW of capacity for $100 and then takes a single MWh of energy during the course of the month for $30 will end up having paid $130.00 for that single MWh, while a similar buyer that actually purchased energy for every hour during the month will have only paid about $30.14[3] per MWh. The first customer's *bill* will be much less ($130) than that of the second customer ($22,420), but the second customer's unit cost of the electricity will be much less than the first.

  - ***Ancillary Services.***

As noted above, reliable power service requires the matching of supply and demand on a near-real time basis. Since there is no mechanism in the market at present to allow consumers to reduce consumption to match supply on a timely basis (much less any means for most consumers to be financially compensated for doing so), suppliers must

[3] $100/(30 days * 24 hours) = $0.14 in average capacity payments plus $30 for energy.

instead stand ready to match changes in consumption. Thus, when people get up in the morning and begin to turn up the heat on a chilly day and make breakfast, suppliers must be prepared to increase generation to match the rising load. Similarly, when people turn off the lights in their homes and go to work, suppliers must reduce generation accordingly and so on throughout the day. The various services that maintain system balance and operating reliably are called "ancillary services."

In California, there are separate competitive procurement markets for the following five ancillary services:

- "Spinning reserve" - generation turbines that are kept running at a relatively low-speed off line that can be brought up to the appropriate speed and turned to feed power into the grid upon 10 minutes' notice and kept running for at least two hours.
- "Non-spinning reserve" - generation that is available but not running, that is capable of being synchronized and ramped to a specified level within 10 minutes, and then capable of running for at least two hours.
- "Replacement power" - generation that is capable of starting up if not already operating, synchronizing with the ISO controlled grid and ramped to a specified load within one hour, and running for at least two hours.
- "Regulation Up" and "Regulation Down" - generation that is already up and running, and synchronized with the ISO controlled grid so that the megawatts generated can be increased ("Regulation Up") or decreased ("Regulation Down") instantly through automatic generation control (AGC). Regulation is used to maintain real-time balance on the system.

The separate market for each of these services creates a price for each that varies throughout the day with market conditions. For a discussion of the ancillary services in California, see Chapter 3 of California ISO, Annual Report on Market Issues and Performance (June 1999) (available at http://www.caiso.com/docs/1999/06/04/19990604162148281 32.pdf).

The difficulty of applying price caps to these different products

- ***Wealth transfers***

Any set of price caps in the wholesale market would have to address all of these products: capacity, energy, and ancillary services. Depending on how one sets the cap for each service, and how any given customer consumes these services, the impact can vary dramatically.

In a simple example (that sets aside ancillary services for the moment), one could achieve an identical ***average*** price cap with either a relatively higher cap on capacity and lower cap on energy, or a relatively lower cap on capacity and a higher cap on energy. The first scenario transfers wealth from lower-than-average consumption purchasers to higher-than average consumption purchasers. Thus a higher cap on capacity and a lower cap on

energy will reward those who consume more energy. Adopting a relatively lower cap on capacity while allowing a higher cap on energy will do the reverse; shifting wealth to those who consume less. Such wealth transfers are inherent in the adoption of any system of wholesale price caps. In addition to showing another layer of the complexity, this further illustrates how price controls do more to ***shift*** costs than to ***control*** prices.

Obviously, the imposition of a price cap on "energy" alone would – much like squeezing a balloon – simply transfer value to the providers of capacity and the various essential ancillary services, as those who desire operating flexibility would be forced to pay more for that flexibility as a means of differentiating themselves from their consuming competitors who cannot bid up energy prices. In turn, squeezing the balloon again, the imposition of a cap on energy *and* capacity *plus* one subset of ancillary services would merely transfer value to the remaining service(s).

Thus, if controlling the price of one power service creates "bulges" in the economics of other power services, why not control them all? There are many reasons why not.

First, the imposition of controls on energy, capacity and *all* of the ancillary services would require that the entity establishing the controls *also* establish the regulatory rules for curtailing services when the capped price is inadequate to attract sufficient supply. In contrast, letting parties bilaterally contract for their needs in an open market at agreed upon prices will achieve equilibrium based on both the buyers' and the sellers' mutual best interest. A customer that has a steady load can buy just the right amount of capacity at perhaps an overall cost for capacity greater than one with a variable load, but the one with the steady load will use less ancillary services to track variations in load. The more variable customer could buy less capacity and supplement it with more ancillary services. One would value ancillary services differently than the other, but each would be free to pay what they value for the services, and would not face government rationing of any particular service. This is the essence of the competitive model that has made the United States such a strong economic power.

Second, one must ask where price control stops? Is it on power output, or on input prices, *e.g.*, natural gas and emissions, which obviously are driven by and affect power demand?

Third, there are practical "rules application" issues.

- ***Practical application issues***

Assuming one can stomach the unintended consequences inherent in attempting to meet the challenges set forth above, the next set of challenges would be practical – how do we develop caps? It appears that there is little support for arbitrary, across-the-board caps in the West.

The next proposal on the list, which garners more support, attempts to avoid the "one size doesn't fit all" aspect of across-the-board caps by setting plant-specific "cost-plus" rates.

Essentially, this describes traditional cost-of-service ratemaking. This proposal has superficial appeal. At first blush, one would think it fair - each generator gets paid for its operating costs plus some profit.

Once one considers the practical aspects of implementing such a proposal, the defects become obvious:

What is the "rate base" used for depreciation and return on equity?

While general ratemaking principles state that rate base is the lower of depreciated cost (book) or market value, that theory would produce inequitable results in California where generation was purchased from IOUs at a price well above book, the incremental amount going to relieve consumers of stranded costs. The FERC denied a proposal by one generation purchaser to allow collection of the above-book amount in regulated rates, based on the fact that the purchaser would be able to collect the difference in the free market. Cost-plus caps eliminate that free market, so generators will expect to be able to collect the increment above book value.

What is the depreciation period?

Many of the plants recently purchased by independent power producers are near the end of their useful lives. Thus, the higher-than-book prices would be depreciated over a short period, resulting in quite high cost-based rates.

What is the denominator?

Rates are calculated by determining a cost of service – fixed costs, depreciation, return on equity, debt service and the like – and dividing this number by the number of units of service expected to be provided. For peaking units in particular this denominator is especially difficult to determine, and will continue to be given the volatility of markets in the West. Of particular concern is the fact that California demand was artificially inflated by capped retail rates and a low hydro year, which would lead to artificially high denominators.

What is the appropriate rate of return?

SoCal Edison's allowed return on equity on its transmission assets – a very low risk set of assets – is 11.6% ***after taxes***. Generation ownership is much more risky and should command a much higher return.

Set up for stranded costs?

Unregulated generation exists outside the traditional regulatory paradigm. That paradigm allows for collection of the full costs of utility investments. Putting independent generation into the traditional regulatory paradigm sets the stage for collection of the "stranded costs" of these facilities.

Highly variable operating costs.

The operating costs of gas-fired generation in particular vary tremendously plant to plant, day to day and hour to hour, depending mainly on fluctuations in gas and emissions allowances. This would necessitate adoption of yet another layer of administration – fuel adjustment clauses. Ironically, this would assure that input-cost increases get passed along to consumers.

How are rates structured?

Historically, retail rates for power are volumetric. That means that peaking and base-load generation costs were averaged into one rate. If unit-specific rates are developed, then peaking plant rates will be astronomical relative to base-load plants and intermediate plants, despite their acknowledged overall cost-effectiveness, will not be built. As discussed above, other rate treatment will result in wealth transfers that will yield unintended consequences.

- ***Multiply these problems by all the plants in the West and then some***

Obviously, it will be very difficult to apply cost-plus rates to all the generators in the West at the same time, much less over a spread-out period. FERC staff would need to be increased substantially to perform these duties, and someone would have to be in charge of allocation of scarce supplies.

Making matters even more difficult is the fact that, as noted above, FERC does not have jurisdiction over municipal, cooperative, Federal agency or Canadian or Mexican generation. Thus, while some generators will be capped, some sources will remain uncapped and will reap the benefits of having customers willing to use price to allocate scarcity.

Other consequences

There are other negative consequences of cost-based rates. If rates are solely based on costs, then hedging will be virtually eliminated – why hedge if there is no risk of disallowance? As noted, increases in raw material costs, e.g., natural gas and emissions, will be passed through without question under fuel adjustment clauses. And, finally, what would be the cost-of-service and rate for marketers who buy and resell power? Would these market participants who provide greatly needed liquidity not be allowed to profit (and thus to participate) in the market? We hope not.

The impact of price caps on other commodities that are critical to the generation of power

- ***Emissions credits***

Any generating facility that consumes natural gas or fuel oil will, of course, emit a certain level of pollutants into the atmosphere, including nitrogen oxide (NOx) and sulfur dioxide (SO_2). The companies that operate these generators must comply with applicable air quality standards, which, as a practical matter, will typically require the generator to purchase NOx and/or SO_2 emissions credits in a federally sanctioned market for these rights. For a good discussion of these rules and markets by the US Environmental Protection Agency, see the discussion of Allowance Trading at http://www.epa.gov/airmarkt/trading.html

The imposition of price caps on power will increase demand for power, thus increasing demand for emissions rights. This would, in turn, result in the shifting of the value to emissions rights and would ultimately require the imposition of price caps on emission credits. Yet the imposition of price caps on emissions trading would make it artificially cheap to pollute, tending to favor the economics of higher-emission generating facilities over the more environmentally benign sources.

- ***Upstream goods and services***

Even if a price control regime were created to separately cap capacity, energy, each ancillary service and all required emissions credits, the price control regime would still not achieve its goals, because the price distortions and cost shifting would be driven back into the upstream markets for natural gas. A third or more of the power that feeds the California market is generated using natural gas. The bulk of that gas is shipped to California over interstate pipeline transmission lines that are themselves integrated with the thousands of miles of such lines that link the North American natural gas pipeline grid from British Columbia to Miami and from Baja to Nova Scotia. And an increasing share of the gas feeding into this transmission grid is liquid natural gas imported in cryogenic tankers from Trinidad, Algeria, Australia and the Middle East.

Any artificial reduction in electricity prices in the western United States would manifest itself upstream into the North American gas market. While it is impossible to predict exactly how the markets would respond, especially over time, one would expect that an artificial reduction of electricity prices in the western United States would tend to encourage over-consumption of natural gas in these markets, thereby resulting in higher prices in other markets, as appears to have already happened. Since the gas markets are highly competitive, the short-term reduction in power prices in the West would be expected to be rapidly matched by *increases* in natural gas prices in all other markets as the gas markets responded to restore a supply and demand balance. In effect, then, the imposition of price controls on western power markets to protect western consumers would simply shift the burden of price increases onto consumers in other regions of the nation, while reducing overall efficiency in the bargain.

CONCLUSION

In the end, controls on wholesale electricity prices will not make the current shortfall of generation in California go away, nor will such a policy ameliorate the situation in any manner. Indeed, price controls:

- will have less impact than intended on consumer prices since a fairly large part of the market will remain uncontrolled;
- will greatly increase the likelihood of real shortages - i.e., blackouts;
- will dramatically distort and slow investment in new plants; and
- will directly and immediately undercut efforts to hedge prices and reduce price volatility.

And, rather than fixing the problem, price controls would instead immediately exacerbate the shortage, by encouraging consumption and discouraging supply – *exactly the opposite of what is needed*.