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Comments of
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The following discussion focuses primarily on utility resistance to energy efficiency measures implemented by customers that significantly reduce electricity purchases. It does not focus on energy efficiency programs managed by utilities or on potential investments by utilities in energy efficiency measures. We should use caution with the latter because such investments are not natural monopoly activities and are not generally appropriate for utility regulation; they should, instead, be part of a competitive market. The discussion does however, envision substantial investment by the utility in communication and system modifications that would allow for optimized two-way power flow in real time, a "smart grid".

Our current regulatory process is based on the needs and values of society a century ago. This was a time when the perceived societal need was for economic growth, based on expansion of industry, development of transportation networks, and exploitation of natural resources. To foster this growth, economic policies evolved that promoted development of large-scale industries such as steel, shipbuilding, and railroads. All of this development required energy and raw materials. Energy utilities developed taking the form of natural monopolies because of the extensive requirement for capital, economies of scale and the need to reduce duplication of effort. Since the monopoly structures could not be controlled by normal market forces, the protection of public interest required either some type of public entity to build and operate the facilities or a system of regulation. In the United States, we chose the latter.

In the early years, electricity production had all of the characteristics of a natural monopoly. As power plants got bigger, they got much cheaper and more efficient. Distribution required use of the public ways, where duplication of effort would be of questionable value. Smaller industrial systems, while sometimes more efficient because of waste heat use, were abandoned and the load integrated into the larger systems. Bigger was clearly better, everyone benefited.

The regulatory systems that evolved supported the maximization of investment within the bounds of usefulness and public interest. The system worked well through the first half century, as our prices consistently dropped and electricity use expanded to most parts of the country. Problems began to form in 1950's when the efficiency of conventional power plants began to peak and in the 1960's when limits were met in the economies of scale. By the 1960's and 1970's, the cost overruns in nuclear plants lead to the

questioning of the basic structure of a highly concentrated industry that was not constrained by the creativity of competitive forces.

By the 1970's, it became clear that there were methods for producing electricity that had the potential for lower cost and higher efficiency, which were not being used by the utilities; in fact, they were being resisted. Many of these technologies could be applied directly by the customers, including renewable resources such as small-scale hydroelectric and the emerging wind and solar. The greatest threat at that time was industrial cogeneration, which could result in large-scale load loss to the utilities because of its very high efficiency. The use of recovered heat in these systems dramatically reduces overall fuel and energy costs. Other efficiency measures by customers also resulted in reduced power sales, but their impact was usually smaller. And, we found methods to mitigate utility resistance to efficiency programs by developing revenue loss recovery incentives and by allowing the utility itself to manage the efficiency programs. However, these efficiency programs did not include customer-owned generation systems, either renewable or cogeneration.

The energy crisis in the 1970's focused attention on these little used technologies. The Public Utilities Regulatory Policy Act of 1978 (PURPA) required utilities to buy power from entities that produced power using renewable resources and cogeneration systems, which met requirements of type of fuel, heat recovery efficiency, and ownership. With the exception of very large power systems, utilities were able to resist the development of these technologies with a wide range of responses, such as: low payments for power purchased, special contracts, standby charges, interconnection requirements, high cost studies, system reinforcement requirements, and denial of access to system benefits money for efficiency improvements.

The failure of PURPA and the lack of competitive discipline led to the movement for restructuring and the separation of the generation activity from the wires business. It was clear that in a highly integrated and interconnected system, generation was no longer a natural monopoly and should be exposed to competition.

The assumption that the separation of the generation activity from the wires would reduce the resistance to customer generated power proved to be incorrect. Reduced sales from a utility generator to its own customers could be counteracted by sales to other utilities, but reduced load on the distribution system resulted in lost income. A system with very low marginal cost sees a dollar loss in sales as a dollar loss in profit.

Simply trying to force utilities to respond to societal need is ineffective, as we saw with PURPA. We must instead try to realign utility interests with society’s developing interests in efficiency, environment and economy. To do that, we must identify both sets of interests, and then modify the regulatory process to provide a balanced response. As part of this process we will need to identify both short and long-term needs.

The following listing of problems and interests should be considered partial and the basis for expanded discussion of the various issues.

- Distribution utility issues

Short-term: Loss of sales results in immediate loss of profit. A larger loss of sales leads to a difficult rate case and delay in recovery.

Long-term: The fundamental source of income to a utility is its investment. The current regulatory structure supports maximization of investment, within the bounds of usefulness and public interest. Loss of sales in the short-term tends to reduce the need for future investment and thereby reduces long-term earnings.

- Distribution customer issues

There is a need for efficiently priced access to a power market for both purchase and sale, and there is a need for safe and reliable distribution system for both purchase and sale.

- Societal issues

Society has a need to dramatically reduce the consumption of fossil fuels for a wide variety of reasons including climate change, national security, environmental degradation and economic disruption. Many of the potential solutions reduce electrical consumption by customers and will, in some cases, allow customers to provide power for use by others. Some of the potential solutions will, on the other hand, increase power consumption while deferring larger fuel use. The interests of the distribution utility should not get in the way of these transactions.

The distribution utility investment is not disciplined by competitive forces. The societal cost of excess investment must be controlled by either direct regulation or preferably by an incentive structure that promotes efficient use of that investment.

Proposed changes to current regulatory procedures

A rate case should establish the utility's cost of doing business and the corresponding revenue requirement.

The revenue requirement minus customer charges would be divided by the expected kWh sales looking ahead to the following year.

Deviations from expected revenue would be trued up quarterly within bounds of rate of change and absolute level.

Demand charges would be replaced by variable kWh adjustments up or down that reflect actual feeder loading.

The utility would be paid to maintain a larger working capital reserve to cover volatility in revenues.

The utility rate of return would be adjusted to reflect risk, service quality and mutually agreed investment utilization targets.

The utility would be expected to make investment in, and adjustments to, its system for customers feeding power to it as it does now for customers taking power from it. The utility would be expected to optimize its operations in support of the new societal needs.

The above changes would relieve some of the near-term problems. They do not change the standard regulatory structure, which is based on cost of service and recovery of investment, other than through improved incentives for higher investment utilization. While it is clear that load loss would reduce the need for future investment, it is not clear that this would necessarily result from efficiency improvements. Electricity use would generally increase with efficiency measures such as heat pumps and electric cars. The fear of continuously increasing distribution charges in a death spiral is unwarranted.