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ADVANCED METERING – HELPING TO SOLVE USA ENERGY PROBLEMS

The US electricity market – and the energy industry itself – continues to face new challenges ranging from lack of transmission infrastructure to abuse of market power by certain energy companies. As policy makers at both the federal and state levels, in both legislative and regulatory arenas, look at what options they have to address these challenges, they have begun to consider – directly and indirectly – advanced metering as one of the answers to some of the problems.

They are taking steps to put new policy in place that should lead to increased deployment of advanced metering by energy companies, and increase the use of such meters by consumers.

WHAT IS DRIVING POLICYMAKERS?

It is commonly accepted that electricity deregulation in the US has not gone as well as had been predicted. Retail choice has only been implemented by a small number of states, and wholesale markets have struggled – and sometimes failed – to make that market segment work such that the lights stayed on. The most attention-getting events occurred in California, where the state has in recent years been in crisis situation, with skyrocketing prices, frequent outages and angry consumers. Events in California went beyond the state's borders and led to traumatic effects on electricity prices and reliability throughout the western US. Policymakers there do not want the situation repeated, and those elsewhere in the country want to prevent similar consequences in their area. Recent revelations that certain generating and marketing companies have been manipulating market prices have also raised concerns.

WHY ADVANCED METERING?

Figure 1 shows the hourly load duration curve for the PJM Power Pool, the regional transmission and wholesale market entity in Pennsylvania, New Jersey, Maryland and the Mid-Atlantic area. It shows that from 1998 to 2000, the highest 15% of load on that system – 7,500 MW – is used only 2% of the time, or less than 200 hours per year. Armed with these numbers, as well as with estimates by experts that a small shift in usage off the peak period can decrease the possibility of electricity shortages, policymakers are recognising that the present situation (whereby consumers get no price signal and pay the same price no matter when they consume power) does not make sense anymore. The answer, they say, is demand response.

Demand response is a new term that refers to dynamic pricing, as in time-of-use, real time or critical-peak-day rates, or dynamic load response,

including appliance/equipment load control, and other interruptible/curtailment programs. While these options have historically been referred to as 'load management', the change in terminology is meant to signify that advances in metering, communications and control technology in recent years have resulted in entirely new capabilities, particularly in terms of enabling consumers to have more choices and more control over their energy bill.

This is of course where metering comes in. Policymakers are realising that in order to provide consumers with price signals and the ability to manage their usage in response to such information, advanced meters are required. Advanced metering has begun to be defined as technology that measures and records usage data, at a minimum, in hourly intervals and which provides usage data to both consumers and energy companies on at least a daily basis. From a performance standpoint, advanced metering refers to hardware and software that allows electricity consumers to participate in price-based, time-sensitive demand response programmes.

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The potential benefit from demand response is significant. \$15 billion in benefits were estimated in a 2001 study by McKinsey Company, with the majority coming – contrary to conventional wisdom – from the residential sector. Others have estimated that a 5% reduction or shift in peak usage can lead to upwards of a 50% decrease in peak wholesale prices, and thus provide a significant check against exercise of market power during those times.

Such a drop in wholesale peak prices also means that non-participants in demand response also share in the benefits, as prices for everyone are held in check. In addition, utilities benefit in a number of ways from the deployment of advanced metering for demand response. With better information and with the ability to communicate with their customers and influence usage patterns, they can optimise their energy supply and delivery planning and operations, and provide new choices for their customers.

A utility that is demonstrating exactly what all this can mean, and one whose efforts have caught the

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eye of policymakers, is Puget Sound Energy (PSE) in Washington State. PSE has provided all its customers with advanced meters and daily access to their time-differentiated usage and price information. To date, the company has over 300,000 of its customers on time-of-use rates. Puget reports a 5% peak reduction on their system as a result of customer response to different prices for different consumption periods and to having information that they never had before. Customers have indicated that they like having both the choice of time-of-use prices and information on how and when they consume. Over 90% have said they would recommend the programme to a friend.

WHAT KIND OF POLICY IS BEING CONSIDERED?

At the Federal level, both Congress and the Federal Energy Regulatory Commission (FERC) are engaged. In Congress, both the House and the Senate have passed versions of comprehensive energy bills – the first major energy legislation to come out of either body in over a decade. Key legislators from the House and Senate are now meeting to iron out the differences between the bills and send a final product to the President for his signature. Both the House and Senate bills contain a tax incentive for advanced metering devices and a new requirement setting a date by which all federal buildings have to be metered or submetered with advanced metering technology. The Senate bill also contains provisions that would allow consumers to ask for and receive time-of-use or real-time rates from their utility. Final Congressional action is expected sometime this fall.

On July 31st, FERC issued its long awaited draft rule on Standard Market Design. FERC's aim is to bring order and efficiency to regional markets by having all of them adhere to common principles and, in some cases, common design, planning and operational criteria. Demand response is squarely on the table in this effort, with FERC setting out how it can be used by utilities and other service providers to meet their obligations to the regional system.

In a report on demand response issued by the National Association of Regulatory Utility Commissioners (NARUC) in July 2002, state regulators were urged to "re-examine" competitive metering based on several factors, not the least of

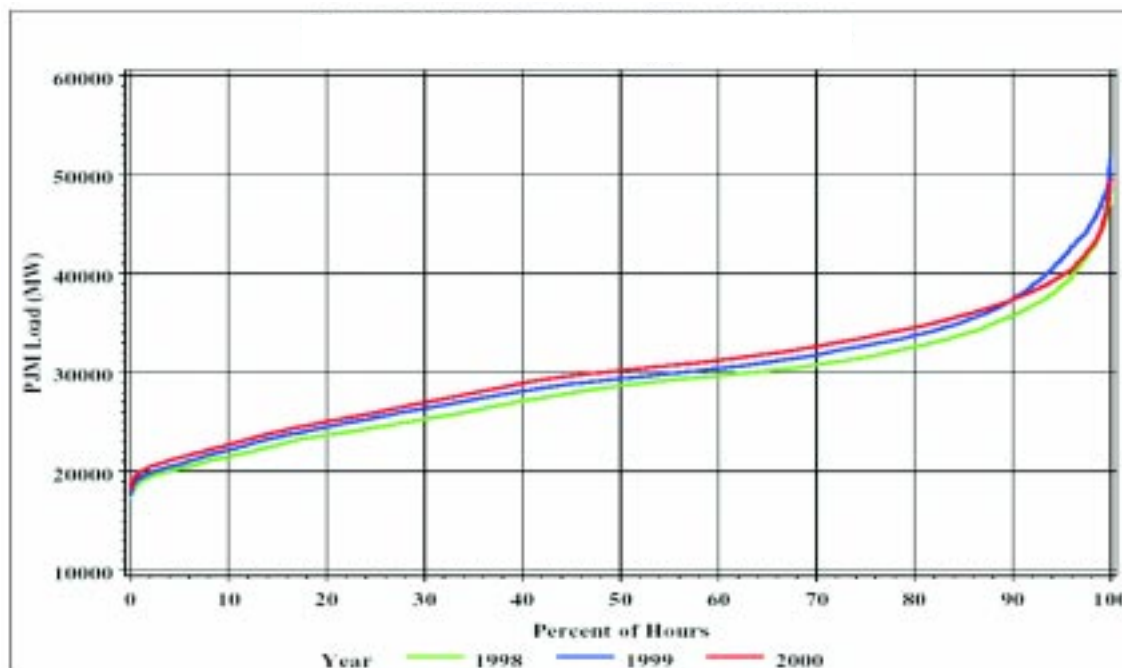


Figure 1 – PJM hourly load duration curve

which is that costs per meter for ad hoc meter installation are proving to be five or six times the cost of doing a broad, utility-scale deployment. The report also recommended that state commissions explore how to move consumers onto dynamic pricing and explore state funding or rate-based funding of advanced meters, to roll the technology out faster and more cost-effectively and enable consumers to participate in demand response programmes.

California, with a population and electricity market larger than that of most nations, is already on the move. In June 2002, the California Public Utilities Commission initiated a rulemaking proceeding aimed at developing and implementing a plan to provide all customers in the state with the enabling technologies and programme options to increase demand response.

In its announcement of the rulemaking, the Commission stated: "demand-responsive capabilities are important regardless of the ultimate electricity market structure that emerges in the next few years. A perfectly functioning wholesale and/or retail electricity market is not a precondition for development of demand response. On the contrary, demand-responsive capability can be a tool in mitigating the effects of a dysfunctional market, as well as for controlling costs, even in a completely vertically integrated and regulated market."

STAY TUNED

Across the United States, policymakers are calling for "new energy technologies" to be deployed to help solve the nation's energy problems. There is also a broad consensus that demand response and advanced metering is one of the answers. As a result, new law and regulation is likely on the horizon that will drive and expand the market for advanced metering and communications and control technologies. **mi**

ABOUT DRAM: The Demand Response and Advanced Metering Coalition is a diverse group of utilities, metering providers, communications technology companies, and public interest groups working to advocate policies aimed at increasing the use of advanced metering and communications technology to provide energy companies and consumers with time-based price and usage information they can use to better manage energy delivery and use.

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