

# THE IMPACTS OF POWER SECTOR REFORM ON DEMAND-SIDE MANAGEMENT

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## **Abstract**

*Reform of the electric industry in other countries and states has had substantial impacts on investment in demand-side resources, both positive and negative. But only in those places where explicit policy care was given to DSM did the reforms have beneficial consequences for the electric system and its customers. A recent study by the IEA's Demand-Side Management Program examined how power sector reform affects DSM. The study found that typical power sector reforms do little if anything to reduce the barriers to DSM and that many reforms, such as Vietnam's separation of generation from the grid, actually increase the barriers to DSM. The IEA study also found that the "...overarching policy barrier that affects all electricity industry structures ...is the lack of regulatory or legislative attention and interest in energy-efficiency issues." This content lists seven major effects restructuring has had on DSM internationally, including energy efficiency.*

**Keywords:** *DSM , IEA, Grid, Regulators and Policymakers, Restructuring.*

## **1. Introduction**

In the electricity sector, more than 30 years of international experience shows that, under the right circumstances, electric utilities can effectively deliver large-scale, cost-effective energy efficiency programs. To assure that electric utilities have a major role in delivering DSM and energy efficiency, proven policies and practices must be adopted that make successful delivery of energy efficiency services a profitable part of the utilities' business.

In Vietnam, VECP and CEEP are both new agencies. Today, their DSM-related responsibilities are still evolving, and many are shared. Adoption of the policy recommendations contained in this report may be the responsibility of one or both agencies.

The DSM policy recommendations are divided into short term and long term options. There is no clear line between these two categories of actions. Judgment has to be used to focus on the short term recommendations that are aimed at the current power shortage. The longer-term recommendations, while not requiring immediate attention, are the important steps needed to assure sustainable power sector reform. Given the severity of Vietnam's current power shortage, long-term policies are less urgent. However, they are critical to the

avoidance of a future shortage and therefore action on them should not be put off for long.

Because Vietnam's experience in implementing load management is already comparatively strong, only two major recommendations relating specifically to load management are made: (a) reforming prices and (b) incorporating demand response in spot-market design and market rules. These are both very powerful tools.

The creation of open and competitive markets for electricity will not reduce the historic barriers to efficiency investments, and some of Vietnam's planned power sector reforms will create new barriers. This is a special concern for Vietnam because the potential for cost-effective DSM including energy efficiency is so substantial. Without increased investment in energy efficiency, unconstrained and very rapid growth in electricity demand threatens Vietnam's environmental, economic, and social sustainability goals.

## **2. Method**

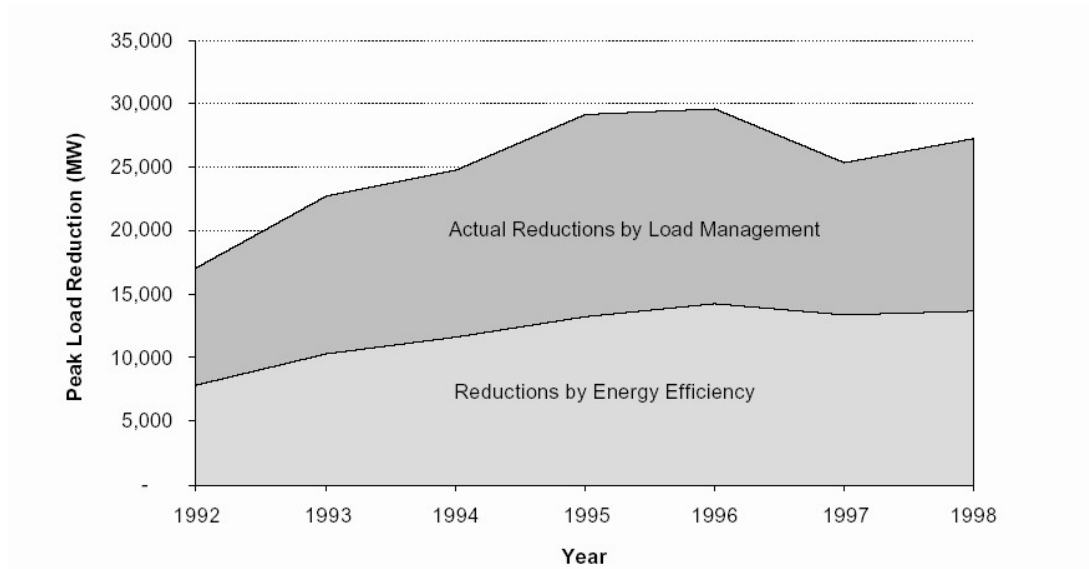
### ***Regulators and Policymakers Shifted Attention and Focus from DSM to Restructuring***

Prior to restructuring, interest in DSM was to a large extent driven by regulatory and policy-maker support for DSM. In the United States, Integrated Resource Planning (IRP) and the experience of a few leading states showed regulators and others that DSM could produce large economic and environmental benefits and could avoid the need to build unpopular and polluting generating plants. This focus yielded substantial policy support for DSM and led to steadily increasing utility investment in DSM and energy efficiency. When the nation's attention turned to restructuring, regulators and utilities focused on issues such as stranded cost recovery, retail access, and the rules for new investment. Uncertainty about who would make new investments and how the costs of new investments would be recovered led to a substantial drop in utility investment in all areas, including DSM and energy efficiency.

Total spending by utilities in the United States on DSM declined by nearly 50 percent between 1993 and 1998. In 1993, utility spending for all DSM (efficiency and load management) totaled \$2.7 billion. At that time, based on the utilities' announced plans, the U.S. Department of Energy projected a 20 percent increase in DSM spending to about \$3.5 billion by 1998. Instead, spending dropped to \$1.5 billion, a decline of 45 percent in four years, and a reduction of 57 percent when compared to the trend line of 1991–93.

Reduction of utility-sponsored DSM programs between 1994 and 1999 dramatically reduced the contribution such programs could have made to meeting both energy needs and peak demands since then. By 1993, DSM-related peak load reductions were growing by about 4,000 MW per year. However, after 1995, progress stalled and total peak load reductions remained virtually flat until 1999.

**Figure 1: Peak Load Reductions from Efficiency and Load Management in the United States**



Source: Cowart, 2001.

In 2000 and 2001, power crises mounted in California and the western United States, and reserve margins narrowed in the eastern United States. As a consequence, demand-side resources received renewed attention and policy makers restored much of the funding that had been cut back in prior years.

### **Focus Shifted from Planning To Markets and Choice**

Proponents of restructuring worldwide believed that retail competition would include innovative offerings by retailers and ESCOs that would overcome the barriers to DSM and energy efficiency. It is important to understand that this has not been the case in any electricity market in any country. The market and regulatory barriers to DSM, especially to efficiency, still remain in restructured systems. In fact, by separating previously integrated utility functions, and exposing power suppliers to short-term price pressures, many restructuring plans have actually increased the barriers to DSM.

### **Unbundling the Utility Also Unbundled the Benefits of DSM**

DSM programs produce generation, transmission, and distribution savings. Worldwide, prior to restructuring, utilities could compare these combined savings to the cost of DSM when deciding whether a DSM program was cost-effective. However, power sector reform in some countries and some U.S. states separated generation from transmission, distribution, and retailing in ways that dispersed the DSM cost savings among two or more separate entities. DSM that would have been cost-effective to a vertically integrated utility

might now not be cost-effective to any single industry participant.

Resources such as energy efficiency (which produces savings in generation), distribution, and transmission are disadvantaged in restructured markets that do not allow participants to capture all those values simultaneously. The separation of generation from monopoly transmission and distribution service is necessary to create fair and competitive generation markets, but it has undermined DSM. The challenge has been to find restructuring options and mechanisms that will capture the benefits of both restructuring and DSM.

### **Restructuring Increased Disincentives for Power Supply Company Investment in DSM**

Separation of generation from transmission and distribution creates smaller companies with lower earnings that magnify the disincentives for grid company investment in DSM. For grid companies net revenue losses (revenue loss minus variable cost reduction) resulting from DSM are essentially the same as was before restructuring. But after separation, the net revenue loss has to be absorbed by a smaller utility total level of revenues and earnings. The same net revenue loss on a smaller level of earnings accentuates the revenue-losing aspect of DSM.

One of the many DSM strategies implemented by regulators prior to restructuring was the increased use of sophisticated meters and pricing options. Many larger customers were required to install real-time or other advanced metering and were required to be on TOU prices. These prices reflected the cost of producing and delivering power at different times and different places. With restructuring and retail access, these customers were free to choose among competing suppliers, or (in most states) to choose a simplified “default service” plan. Customers were no longer required to be on any particular price structure. Many of these customers preferred the certainty of fixed prices to the more efficient TOU prices they were previously required to take. Thus, although the expectation of many was that restructuring would lead to innovative pricing, retail competition helped many customers avoid the price volatility of generation markets, and dampened their interest in load management options that could provide benefits to the grid as a whole.

### **Increased Price Volatility Encourages Load Management**

Many restructured markets have experienced much higher levels of price volatility. Where restructured markets have exposed customers to this price volatility, customers have responded in a variety of ways. Some have changed to suppliers that offered stable prices and some have invested in load management options.

### **Retail Access Has Increased Prices for Some Industrial Customers**

In many countries and some U.S. states, industrial customers were given preferential prices below market prices. Restructuring in some places resulted in the loss of these subsidized prices and industrial prices increased. Industrial customers' responses to higher energy prices have included increased investment in DSM and energy efficiency. It is thus important that restructuring plans provide for technical and financial assistance to energy-intensive industries, to lower their costs and improve their competitiveness.

### **3. Results**

In order to effectively implement DSM programs as well as energy saving programs according to the set goals, it will not be possible to successfully implement them without the synchronous coordination between implementing agencies and management agencies. competent state management together with a clear DSM and energy saving legal framework. Therefore, in the coming period, the issues of policy and mechanism that need to be considered and implemented soon are:

- Completing the legal framework for DSM power demand management activities;
- Promulgating documents guiding current Laws and Decrees related to electricity demand management activities;
- Develop appropriate mechanisms, policies and energy tariffs to ensure the goal of energy conservation, and encourage economical, efficient and rational use of all forms of energy;
- Develop mechanisms and policies to gradually establish a financial fund to ensure the successful implementation of the contents of the DSM programs;
- Develop and issue energy efficiency standards for equipment used as a basis for the recognition of energy-saving products. Strict monitoring and inspection mechanisms for the quality and efficiency of energy use of equipment;
- Organize a network of energy saving and efficient management and use to provinces and centrally-run cities.

In order to implement DSM programs effectively and sustainably, it is necessary to conduct research towards the establishment of a Public Benefit Fund (PBF) including spending on DSM activities: The establishment of a Benefit Fund can be considered. public benefits in Vietnam on the basis of fees included in the electricity price. The PBF will spend a small part on DSM activities. Lessons learned on success in DSM activities and energy saving in countries around the world show that the allocation of capital from the PBF fund for DSM activities should be assigned to the Electricity Regulatory Authority to supervise the implementation.

The establishment of a Public Interest Fund will be an important basis to ensure the successful implementation of the DSM program and save energy because it must not only ensure adequate resource allocation, but also force agencies to establish and implement a rigorous project lifecycle management approach to keep DSM budget and energy efficient. International experience shows that regular energy efficiency assessments are the basis for recognizing the energy-saving achievements of DSM and energy-saving plans and the evidence against which key planners The policy further allocates resources for DSM activities and saves energy implementation.

If the peak cutting efficiency and energy savings of DSM and energy saving programs are a quantifiable resource, equivalent to the energy supply, it can help policymakers to devise incentives, regular control and quantification of program results. It is necessary to create a closer link between DSM programs and energy saving programs: In our country today, energy saving programs implemented by the Ministry of Industry focus more on construction and develop institutions to encourage mechanisms for energy saving implementation such as supporting energy audits, setting minimum energy efficiency standards and energy stamping regulations; promotion and public awareness raising.

The current DSM program implemented by EVN focuses mainly on equipment - mainly customer equipment such as lighting equipment and electrical appliances. The lack of synchronization between energy saving programs and DSM will likely create a “policy loophole” with many DSM and energy saving opportunities being missed.

Institutional setting up of DSM and energy saving programs in Vietnam: In the past, DSM programs were often implemented by power companies because of the financial benefits brought from the reduction of peak load demand. instead of having to add new supplies.

In the current period, when the electricity industry is in the process of reforming in the direction of strongly separating power generation, transmission and distribution functions along with the development of the electricity market, international experience has shown that found that an independent agency responsible for implementing DSM programs would be essential and highly effective.

There are several conclusions that can be drawn from international experience with restructuring and DSM:

- The expectation that the power sector will be reformed leads to significant reductions in existing DSM programs or makes it very difficult to implement such programs.
- Power sector reform will not address energy efficiency or DSM unless the government adopts specific policies that make them a part of the restructuring process.
- Separation of the grid from generation makes it more difficult for any one entity to

see the full value of energy efficiency. A single buyer, however, retains the incentive to capture all of the generation, transmission, and distribution value of DSM, provided that buyer has the proper regulatory incentives and policy support to do so.

- Markets deliver what they are designed to deliver. If the market is designed to deliver energy efficiency, it will. If it is not designed to deliver energy efficiency, it won't.

- To solve these problems, explicit action will need to be taken by decision makers. In the final chapter, an integrated set of policies that will promote cost-effective DSM investment in a reformed Vietnamese power sector is recommended.

#### **4. Discussion and Conclusion**

When applying DSM the revenue of Powers may be reduced and due to the investment cost for DSM, that will lead to electricity price increase. The DSM program usually saves customers electricity bills, but this only seems to be true for high-capacity customers as it is likely that the amount of electricity avoided due to reduced power consumption is higher than the amount paid due to an increase in electricity prices. . With regard to customer objections to the DSM program in terms of price effects, to address this issue Powers need to develop extensive proposals that address the needs of price-sensitive customers and try experience DSM programs where the customer pays the full cost of the program through loan mechanisms.

Power shortages can lead to poor decision making that has negative long-term economic and environmental consequences. For example, power shortages have led to decisions to delay or waive environmental rules and to the acceleration or construction of uneconomic power plants. Many countries, including the Philippines, India, and Indonesia, have entered into expensive long-term power contracts that caused lasting economic and political problems. Signing overly expensive contracts is not unique to developing countries. One of California's responses to the power crisis was to sign numerous long-term contracts, mostly with new gas-fired plants. As the crisis passed, the contracts were widely seen as being far too expensive.

DSM responses, on the other hand, can help meet electricity demands and provide reserve margins without adding to stresses on already-burdened transmission and distribution systems. By lowering demand at customer sites, rather than relying solely on new central-station generation, DSM allows grid companies to concentrate their capital resources on the most pressing grid upgrade requirements, while deferring other upgrades, lowering the cost of distribution, and improving reliability in many locations Energy efficiency investments can be highly targeted. For example, Commonwealth Edison, the utility serving the U.S. city of Chicago, targeted aggressive energy efficiency investments to neighborhoods where load growth was straining overloaded distribution

systems. Other systems have put more emphasis on efficiency measures that have benefits for high peak load (targeting, for example, commercial lighting and air conditioning). In other cases, as in Brazil or the Pacific Northwest during drought conditions, the goal was to save energy in all hours, leading to a number of DSM resource choices. The lesson here is that there are many kinds of DSM resources and they can be strategically deployed to meet system needs in a variety of ways.

As the case examples above make clear, utilities and government agencies in California achieved dramatic savings from aggressive DSM efforts in 2001–02. Agencies in the Pacific Northwest and in New York also achieved significant savings and system improvements. In contrast, Brazil’s response to the crisis was hampered critically by the relatively weak experience of utilities and government agencies in delivering efficiency services to customers.

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