IMPACT OF UTILITY DEMAND-SIDE MANAGEMENT PROGRAMS ON US ELECTRICITY DEMAND: 1990-2010

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This paper provides estimates of the likely impacts of utility demand-side management (DSM) programs on US electricity demand through the year 2010. DSM estimates are developed for the following program categories: load controls, load shifting, *efficient buildings*, *equipment and processes*, *electrification*, innovative rates, and *self-generation*. Impacts are provided for annual energy consumption, summer and winter peak demands, and summer and winter off-peak demands.

The analysis includes the development of a base case forecast using EPRI's residential (REEPS), commercial (COMMEND), and industrial (INDEPTH/ERG) end-use models and data bases to establish intrasector electric end-use shares. These shares are calibrated with national economic and electric usage forecasts to develop base case consumption projections by end use. These base case projections include the impacts of "naturally occurring" efficiency improvements and mandated appliance standards.

DSM impacts are developed for a range of DSM options from estimates of likely unit energy and load impacts and market penetration rates. Given the considerable uncertainty in the impacts of utility DSM programs due to variations in real *electricity prices*, economic growth, industry capacity (future demand), unit program impacts, program penetration rates, and the level of utility interest in implementing DSM programs, a probability distribution of possible outcomes is presented in addition to point estimates.

INTRODUCTION

Demand-side management (DSM) encompasses utility programs designed to encourage customers to modify their pattern of electricity usage, including the timing and level of electricity demand. DSM has begun to emerge as a major component of utility planning, with recent EPRI surveys indicating more utilities than ever before are using it to help meet their own needs and those of their customers. Accompanying this growth in utility participation in DSM is a greater diversity in types of DSM activities.

DSM includes *only* those load-shape modifying activities that are undertaken in response to utility programs. Specifically, any effects that are not directly attributable to utility programs, such as those associated with generally rising electricity prices or with legislated building or appliance efficiency standards, are incorporated into the base case forecast, and thus not counted as DSM impacts. Moreover, market-related trends toward more efficient appliances and systems which are taking place independently of mandated standards are also not counted as DSM.

This paper presents estimates of current and likely future DSM impacts on aggregate US electric energy requirements. These aggregate results can be used to gain a broad understanding of the potential role of DSM options in meeting future resource needs, and to illustrate the likely impacts of various program categories. Depending on individual system characteristics and DSM objectives, however, DSM impacts for specific utilities may well vary markedly from these aggregate national results. DSM opportunities will differ across utilities due to variations in climate, the nature of residential, commercial, and industrial end uses, and utility commitments to acquire DSM resources.

DSM Program Categories

There are several ways to categorize DSM programs, including customer class, end use, technology, and marketing strategy. Our approach, which classifies individual DSM programs into six program categories based on the technologies involved and how they are applied, is chosen because of the available data. Inclusion within any particular category is based on the primary impact of each technology. The program categories are:

- Load Controls
- Load Shifting
- Efficient Buildings, Equipment, and Processes
- Electrification Programs
- Innovative Rates
- Self-generation

For example, an electric add-on dual fuel heating system is classified as an electrification option since the technology ultimately increases electricity usage, while a fossil-fuel add-on dual fuel heating system is included in the efficient building and equipment category since it ultimately conserves electricity.

METHODOLOGY

Overview

Estimates of DSM impacts are derived from a series of building blocks. First, a base case forecast is developed for each sector and end-use. This forecast includes estimates of equipment saturation, unit energy consumption (UEC) estimates, and energy-use intensities (EUI). Second, incremental percentage impacts associated with over 70 programs/technologies are estimated from a comprehensive literature review, discussions with technology experts, and data from selected equipment vendors. Third, program penetration rates are developed, consistent with end-use saturations in the base case and with program participant estimates reported by utilities. Fourth, national impacts for each program are estimated as the product of unit consumption values, percentage impacts, and number of program participants. These estimates are then summed over all six categories to yield the net DSM impacts.[1]

While this approach is conceptually straightforward, its application is inherently complex and uncertain. The calculations are relative to the base case forecast, so it is necessary to carefully develop the forecast and DSM impact assumptions to avoid double counting and maintain overall consistency. The base case forecast, developed through simulations with various EPRI models, is calibrated to the North American Electric Reliability Council's (NERC) aggregate of utility forecasts that already includes some projected DSM impacts. In order to create a *reference* forecast that is designed to represent the level of demand expected if *no* utility DSM programs were offered, adjustments are made to the base case to add back in the effects of DSM

[1] *See Barakat & Chamberlin, Inc. (1990),* Impact of Demand-Side Management on Future Customer Electricity Demand: An Update, *Electric Power Research Institute, forthcoming, for an extensive description of all the programs/technologies, associated impacts, and penetration rates.*

programs known, or expected to have been included already. The reported percentage impact values are then calculated relative to the reference forecast. This procedure also more readily permits comparison of the magnitude of various DSM options to alternative supply-side resources. Sources of uncertainty in the impact estimates include uncertainty in the base case forecast, unit impacts, and program participation rates. The role of uncertainty and its treatment in this study is detailed in the section below on risk analysis.

Energy and load impacts are estimated for the six DSM program categories mentioned earlier. Estimates for 1990, 2000, and 2010 are provided, where applicable, for annual energy consumption (GWh), and for demand (GW) during the following prototypical time periods: summer peak demand (4 pm), summer off-peak demand (4 am), winter peak demand (7 pm), winter off-peak demand (4 am).

Derivation of the Base Case

Estimates of base case annual energy consumption, peak demand, and off-peak demand by end-use for each sector are developed for the years 1990, 2000 and 2010. Inter- and intra-sector energy shares are derived from EPRI's system of end-use models and databases (REEPS, COMMEND, and INDEPTH/ERG). Base-year consumption estimates for the residential, commercial, and industrial sectors are developed by calibrating the end-use model estimates with usage data from the Energy Information Administration (EIA). These estimates are then calibrated to NERC's *1988 Electricity Supply & Demand Forecast for 1988-1997* through the year 2000. A somewhat lower growth rate based on results from a recent study by the Edison Electric Institute, is used to complete the forecast through the year 2010. Simulations from the end-use models are used to allocate the national forecast totals down to the end-use level. Peak and off-peak demands are also estimated at the sector and end-use level, using tables and figures contained in EPRI and utility reports to develop stylized load shapes.

Some adjustments are made to the residential forecasts to reflect the impacts of national appliance efficiency standards. This is accomplished by using new appliance energy consumption (often referred to as unit energy consumption, or UEC) data from *The Most Energy-Efficient Appliances*: 1989-90 edition, published by the American Council for an Energy-Efficient Economy (ACEEE), and the requirements of the National Appliance Energy Conservation Act of 1987 (NAECA). Appliance usage estimates from these sources are used to adjust REEPS UEC estimates for *new* equipment through the forecast horizon.

Determination of Likely DSM Impacts

The methodology for estimating likely DSM impacts involves the following steps:

- **Identification of the potential market.** In the residential sector, appliance saturation data from REEPS are multiplied by the number of total households to yield the number of customers with each end-use device. In the commercial sector, fuel share data from COMMEND are multiplied by total square footage to provide the number of square feet for each end-use. In the industrial sector, the base case end-use demand and energy totals are used directly as a measure of the size of the potential market for each end-use.
- **Unit DSM program impacts.** Units are developed for each program/technology for the residential and commercial sectors. End-use load profiles developed for the base case are used to derive unit estimates (kWh, kW, kWh/square foot, kW/square foot) based on percentage change(s) for each DSM option. These percentage changes for each DSM option are used directly in the industrial sector without a conversion to unit impacts, except for innovative rate impacts where data on per-participant impacts are available.
- **Market penetration rates for each program/technology.** These are estimated as the product of three factors: (a) percentage of utilities with the program; (b) percentage of customers who are targeted by the program; (c) the cumulative percentage of customers within the target market who choose to participate.
- **National impact of each DSM option.** This is estimated as the product of the number of participants (or square footage), and the

associated unit impact (per customer, per square foot, or percentage of base case).

It should again be emphasized that the two key factors--market penetration rates and unit impacts (per participant or per square foot)--are intended to represent *incremental* values, those impacts directly attributable to utility programs over and above the "naturally occurring," market-oriented, and legislated impacts accounted for in the base case forecasts.

LOAD SHAPE IMPACTS

Likely impact estimates across the six DSM program categories are contained in Table 1. Positive numbers indicate *decreases* in electricity use relative to the trends in the reference forecast, and negative numbers show *increases* in electricity use. DSM impact estimates for the six program categories are reviewed in the following sections.

Load Controls

Residential load controls include both air conditioner and water heater cycling programs. DSM impact estimates for thermal storage and dual fuel programs to reduce space heating loads are contained within the load shifting, efficient buildings and equipment, and electrification categories. DSM impact estimates for load control programs indicate that summer peak demand will be reduced by over 3 GW in 1990, over 4.5 GW in 2000, and 6 GW in the year 2010. Winter demand reduction estimates are much lower, growing from about 1 GW in 1990 to 3 GW in 2010. Impacts are smaller in the winter since they are derived only for water heater cycling programs. Annual reductions in energy consumption from load controls are expected to range from nearly 150 GWh in 1990, to over 200 GWh in 2000, and over 250 GWh in 2010.

Load Shifting

The load shifting DSM programs refer to a special class of technologies--those that are designed to shift loads from the peak, with little, if any, effect on annual energy consumption. Included here are commercial cool storage systems, residential water heating and space heating storage systems, and industrial load shaping.

Over time, summer peak loads are shifted more than winter peak loads since the largest impacts are associated with commercial cool storage programs. The summer peak is estimated to be reduced by nearly 0.2 GW in 1990, but the magnitude of the reduction is expected to increase to 2.5 GW in 2000, and 5.7 GW in 2010. Winter peak demand reductions are estimated at 0.25 GW in 1990, 1.3 GW in 2000, and 2.6 GW in 2010. Off-peak demand increases are slightly higher than the peak reductions. The summer off-peak load is estimated to be increased by 0.2 GW in 1990, 2.7 GW in 2000, and 5.9 GW in 2010, while the winter off-peak load rises by .5 GW in 1990, 2.3 GW in 2000, and 4.5 GW in 2010. Annual energy consumption is expected to be reduced slightly as a result of these programs, with the inclusion of high-efficiency equipment in conjunction with the load shifting technologies outweighing the minimal energy-using characteristics of the storage systems alone.

Efficient Buildings, Equipment, and Processes

The category includes a wide array of programs across all three sectors, such as high efficiency air conditioning, refrigeration, and lighting equipment, energy efficient building design, high-efficiency and adjustable speed motor drives, and many more. While most programs are expected to gain substantial increases in market share, the impact of the 1987 Appliance Efficiency standards is estimated to reduce the DSM impacts associated with refrigerator and freezer rebate programs. With very few models' energy savings exceeding the standard's requirements by a significant amount, these programs are not likely to pass cost-effectiveness tests. In the aggregate, efficient buildings, equipment, and processes programs are estimated to reduce annual energy consumption by 24,000 GWh in 1990, 94,000 GWh in 2000, and 211,000 GWh in 2010. Both summer and winter peak demands are also reduced across all hours, although the demand reductions are less than energy reductions in percentage terms for many programs. Summer peak demand reductions rise from over 4.8 GW in 1990 to nearly 30 GW in 2010. Winter peak demand reduction estimates exhibit similar growth, with a reduction of 4 GW in 1990 climbing to a reduction of nearly 26 GW in 2010.

Table 1. DSM Impact Estimates

PROGRAM CLASSIFICATION	1990					2000					2010			
	ANNUAL ENERGY (GWh)	SUMMER DEMAND ON-PK (GW)	SUMMER DEMAND OFF-PK (GW)	WINTER DEMAND ON-PK (GW)	WINTER DEMAND OFF-PK (GW)	ANNUAL ENERGY (GWh)	SUMMER DEMAND ON-PK (GW)	SUMMER DEMAND OFF-PK (GW)	WINTER DEMAND ON-PK (GW)	WINTER DEMAND OFF-PK (GW)	ANNUAL ENERGY (GWh)	SUMMER DEMAND ON-PK (GW)	SUMMER DEMAND OFF-PK (GW)	WINTER DE ON-PK (GW)
Load Controls	157	3.4	0.0	1.4	0.0	219	5.0	0.0	2.4	0.0	270	6.4	0.0	3.4
Load Shifting Programs	45	0.2	(0.2)	0.3	(0.5)	743	2.7	(2.9)	1.4	(2.5)	1,654	6.1	(6.5)	2.8
Eff. Buildings, Equip., & Proc.	26,811	4.9	2.1	4.2	2.7	103,331	16.0	8.2	13.1	9.5	236,029	31.7	16.5	26.8
Electrification Programs	(8,289)	(0.9)	(0.5)	(1.4)	(1.6)	(26,342)	(2.8)	(1.4)	(4.9)	(7.1)	(46,768)	(5.0)	(2.4)	(8.3)
Innovative Rates	2,070	9.9	(0.9)	8.8	(0.7)	6,442	20.4	(2.8)	18.0	(2.5)	8,593	30.7	(3.6)	26.6
Self-generation	12,160	1.8	0.7	1.6	0.7	21,830	3.4	1.4	2.9	1.4	44,789	6.9	2.8	5.6
Overall DSM Impact	32,955	19.3	1.3	14.8	0.5	106,223	44.7	2.5	32.9	(1.2)	244,567	76.7	6.8	57.0
Reference Forecast	2,887,565	540.0	209.4	499.9	306.3	3,517,408	682.4	259.0	623.2	379.1	4,105,143	797.6	298.0	727.1
Percent DSM Impact	1.1%	3.6%	0.6%	3.0%	0.2%	3.0%	6.5%	1.0%	5.3%	-0.3%	6.0%	9.6%	2.3%	7.8%
Forecast Net of DSM	2,854,610	520.7	208.2	485.1	305.8	3,411,185	637.8	256.5	590.3	380.3	3,860,576	720.9	291.3	670.2

Electrification

Electrification includes the promotion of high efficiency electric equipment such as induction heating/melting, industrial process heat pumps, advanced electric fryers for commercial cooking, and some residential heat pump programs to replace less efficient fossil-fuel equipment. Overall, these programs are estimated to increase annual electricity consumption by 8,000 GWh in 1990, 25,000 GWh in 2000, and 43,000 GWh in 2010. Both summer and winter kW demands are also increased across all hours, although the rising demands are less than energy increases in percentage terms because of the seasonal and off-peak load increases associated with many programs. Winter off-peak demands are estimated to have the largest impacts, with demand being increased by 1.7 GW in 1990 to over 11.8 GW in 2010. Winter peak demand increases are estimated at 1.5 GW in 1990 and 7.6 GW in 2010. Summer peak and off-peak impacts are driven by the use of new industrial sector technologies, so the peak impacts are larger because of this sector's relatively high load factor. The summer peak is increased by .5 GW in 1990 and nearly 5 GW in 2010. Summer off-peak additions are estimated at .5 GW in 1990 and 2.4 GW in 2010.

Innovative Rates

Summer peak demand reductions from all time-of-use rates are estimated to rise from almost 3 GW in 1990 to nearly 12 GW in 2010. Winter peak demand reductions are estimated at 2.3 GW in 1990, rising to 9.5 GW in 2010. On average, about 30% of the reduced demand is shifted to an off-peak demand increase. The net impact of TOU rates results in a decline in energy usage. Annual energy consumption decreases are estimated to rise from 2000 GWh in 1990 to nearly 8,500 GWh in 2010.

Impact estimates from Interruptible and Curtailable rates do not grow as much over the horizon. This is because of the relatively high existing saturation of these rates among potential sites today. Summer peak demand impacts are estimated at 7.1 GW in 1990 and 13.4 GW in 2010. Winter peak demand reductions rise from 6.3 GW in 1990 to 11.9 GW in 2010. Annual energy consumption and off-peak demand impacts are estimated to be negligible. EPRI research indicates that some firms increase consumption in the period following the interruption, others continue the reduction. The net effect is that no shifting occurs and energy impacts are negligible.[2]

Self-Generation

Self-generation impact estimates include the installation and use of commercial and industrial systems for self-use that are due to utility-sponsored programs. EEI's 1989 forecast of total self-use cogeneration through the year 2000 is the starting point for deriving DSM impact estimates. According to industry experts, very small shares (10% commercial and 15% industrial in 2000) are attributable to utility programs.

DSM self-generation energy reductions rise from 11,000 GWh in 1990, to 42,000 in the year 2010. Summer peak demand reductions rise from 1.8 GW in 1990, to 6.9 GW in 2010, while winter peak reductions rise from 1.6 GW in 1990 to 5.7 GW in 2010.

Overall DSM Impacts

Overall impact estimates as a percent of the reference forecast are summarized in Table 1. These estimates combine the *decreases* in annual energy and peak-demand requirements from most of the program categories with the increases resulting mostly from the electrification programs.

For all sectors, DSM programs are estimated to reduce annual energy consumption by 1.1% in 1990, 3.0% in 2000, and 6.0% in 2010. Summer peak demand reduction estimates are 3.6% in 1990, 6.5% in 2000, and 9.6% in 2010. Winter peak demand is estimated to be reduced by 3.0% in 1990, 5.3% in 2000, and 7.8% in 2010. Small net off-peak load reductions occur in both seasons.

For those who see the impact estimates as smaller than expected, it is important to recall that DSM

[2] *Christensen Associates (1988),* Customer Response to Interruptible and Curtailable Rates, Volume 1: Methodology and Results. *EPRI EM-5630, Vol. 1. Palo Alto: Electric Power Research Institute.*

includes *only* those load-shape modifying activities that are undertaken in response to *utility programs*. There will also be impacts from sources other than utility programs. For example, a forthcoming EPRI study indicates that energy savings of nearly 9% from legislated standards and market efficiency improvements are built into the base case forecast for 2000.[3]

A related issue is the relationship between the efficient building and equipment DSM impact estimates and the "blitz" electricity concept called maximum technical potential (MTP). EPRI estimates that potential savings of 24-44% can be achieved in the year 2000.[4] If one simply takes the per unit impacts in this study and applies a value of 100% across the three market penetration variables for each efficient building and equipment option, the maximum technical potential would be over 40%. MTP estimates are necessarily much higher than DSM impacts because (a) cost-effectiveness is not taken into account in MTP estimates, and (b) market penetration is 100%. For a comparative perspective, the likely DSM energy impacts estimated in this paper are displayed in Figures 1 and 2, with "naturally occurring," standards-induced, and market-oriented efficiency improvements already included in the base case forecast, and estimates of maximum technical potential.

RISK ANALYSIS

Sources of Uncertainty

The DSM impact estimates described above are subject to a great deal of uncertainty. The primary sources of uncertainty are:

- **Unit impacts of each program/technology.** The impacts in each sector are affected by the inherent uncertainty in the base case end-use and demand consumption shares. In the residential sector, per participant impacts are also uncertain because of variations in appliance saturations and the percentage change associated with each program or technology. Commercial sector per square foot impacts are similarly affected by uncertainty in end-use equipment saturations, fuel shares, and the percentage impacts associated with each DSM option. Industrial sector estimates are influenced by the percentage changes attributed to the various DSM options.
- **Market penetration of each program/technology.** Several sources of uncertainty affect the market penetration of each option, including the share of utilities with the program, the applicability or target market share, and the level of customer acceptance.
- **Aggregate forecast of electricity consumption.** The impact uncertainty addressed in the first bulleted item may capture some of the uncertainty in the long-term forecast. In this context, however, the uncertainty refers to the denominator used to estimate the aggregate percentage savings across sectors/programs.

Analytical Framework and Assumptions

Uncertainty in the DSM impact estimates is addressed by attaching probability distributions to each of the three main sources of uncertainty. A 90% confidence interval for the DSM impacts is developed through stochastic simulations using Latin Hypercube sampling. One thousand iterations are employed to yield the final results.

The uncertainty in the unit impacts is modeled through independent uniform distributions, with the end points given by the unit impact estimates reported in Appendices A-C, plus or minus 50%. For example, residential air conditioner summer peak demand impacts are estimated at .80 kW for the year 2000, so its uniform probability distribution is bounded by .40 kW at the low end and by 1.20 kW at the high end.

The uncertainty in the DSM participation levels is also modeled through uniform distributions. These are assumed to be perfectly dependent on the

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3 *Gellings, Clark W., Ahmad Faruqui, and Ken Seiden, "Estimating Efficiency Improvements Embedded in Utility Forecasts," working paper, December 1989.*

4 *Barakat & Chamberlin, Inc. (1990),* Efficient Electricity Use: Estimates of Maximum Energy Savings. *EPRI CU-6746.*

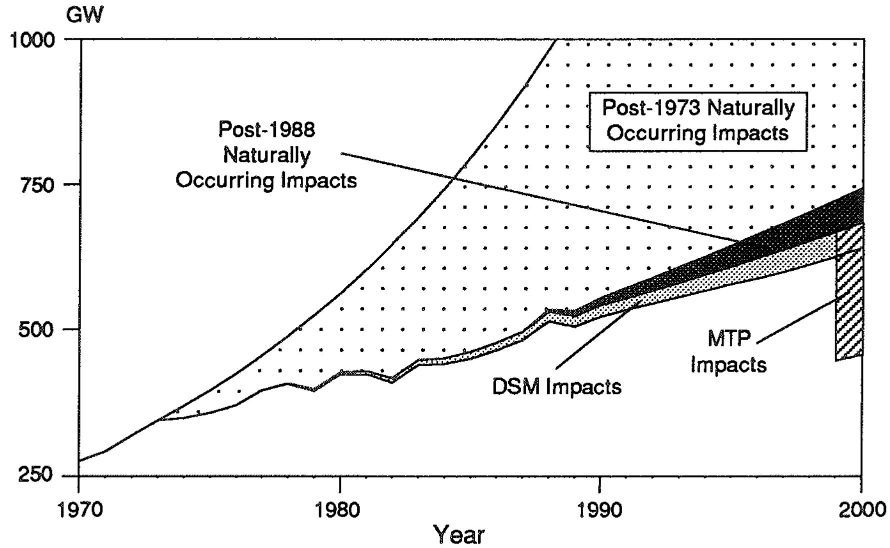

Figure 1. Alternative Estimates of Summer Peak Demand Impacts

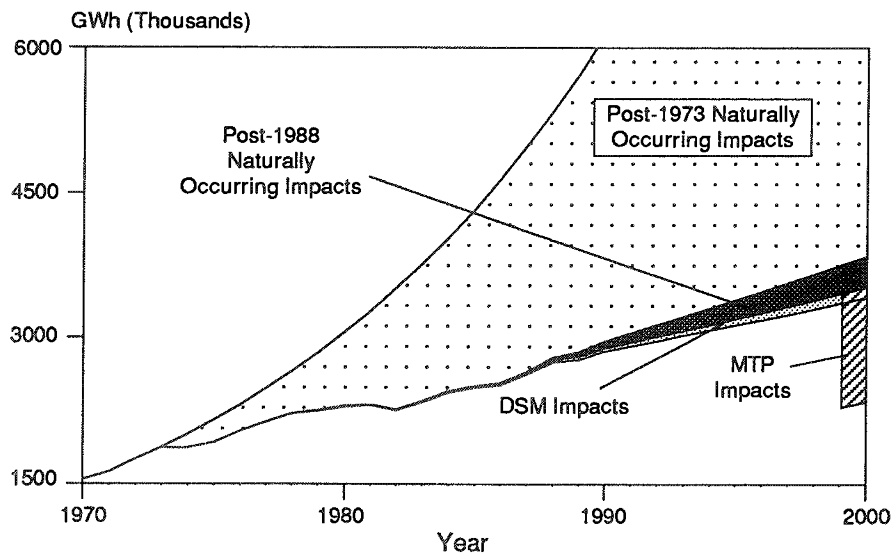

Figure 2. Alternative Estimates of Electric Energy Savings Impacts

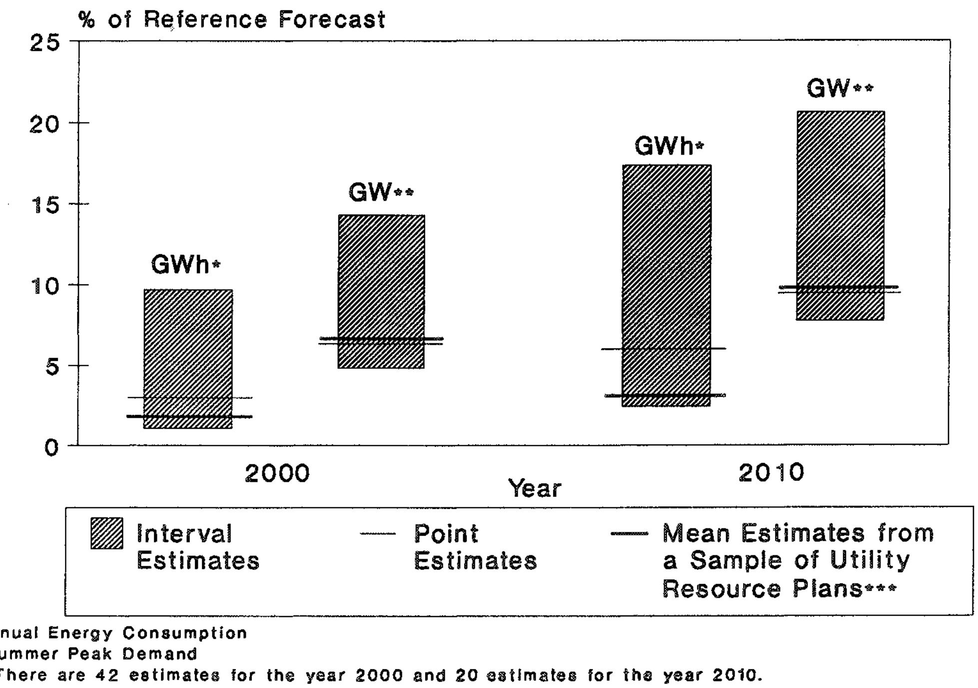

Figure 3. Comparison of DSM Impact Estimates with Estimates from Utility Plans

outcome of the third source of uncertainty, the level of aggregate electricity consumption. A dependency coefficient of 1.0 is used for all program categories except electrification where it is set at -1.0.

The upper bounds, or maximum participation levels, for the nonelectrification programs are likely to be realized in an environment of high aggregate electricity consumption, low energy prices, high economic growth, and national and state energy policies that strongly encourage energy conservation. The lower bounds are likely to be realized in an environment of low aggregate electricity consumption, high energy prices, low economic growth, and a business-as-usual emphasis in national and state energy policymaking.

Uncertainty in the DSM participation rates is modeled through probability distributions that are asymmetrically tilted towards the high-end in the years 2000 and 2010. The lower bound is always 50% below the estimated level, while the upper bound can be as high as 5 times the estimated level. As shown in Table 2, the degree of asymmetry is determined by participation levels, participation rates, program maturity, program potential, customer capital costs, and customer reviews of technologies.

Uncertainty in the aggregate electricity forecast is modeled through triangular distributions defined by three parameters: (1) a most likely value--set equal to the reference forecast values, a minimum value, and a maximum value. For 1990, the distribution bounds are the forecast plus or minus 2%. For 2000, the distribution bounds are from the NERC forecast (NERC 1989), with the lower bound reflecting a 1.1% annual growth rate and the upper bound reflecting a 2.7% annual growth rate. For 2010, the lower bound is consumption in 2000 or zero growth, and the upper bound reflects a 2.5% annual growth rate after the year 2000. The 2010 value chosen in the sampling process is fully dependent on the 2000 value chosen; if the upper bound is sampled in the year 2000, high energy consumption growth continues through the year 2010.

Key probability distribution parameters for all of the sources of uncertainty are summarized in Table 3.

Table 2. DSM Participation Rates Upper Bound Assumptions for 2000 and 2010

Type of Program	Upper Bound
Most programs that have run full scale for several years prior to 1990, are already adopted by a majority of utilities. Examples: Time-of-Use and Interruptible & Curtailable Rates	Estimated participation level * 1.5
All electrification programs, programs with high capital costs for participants, or low market potential. Examples: Commercial Cool Storage (TES), Dual-Fuel Heating Systems.	Estimated participation level * 2
Most programs other than electrification, some have run full scale for a few years prior to 1990, and have been adopted by a *minority* of utilities with high-market potential. Examples: Commercial high-efficiency lighting, residential high-efficiency air conditioning.	Estimated participation level *3
Programs have run as pilots in most cases before 1990, and have been adopted by a few utilities, with high market potential. Examples: Residential lighting (compact fluorescents), Commercial energy-efficient design.	Estimated participation level * 4
Few pilot programs before 1990, potential for capital cost reductions, high-market potential. Examples: Industrial motor downsizing, Heatpump water heaters.	Estimated participation level * 5

RESULTS

Interval estimates for DSM impacts across annual energy consumption summer peak demand and winter peak demand from the Latin Hypercube simulations are shown in Table 4.

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Table 3. Probability Distribution Parameters

Source of Uncertainty	1990	2000	2010
Unit Impacts			
Lower Bound	-50%	-50%	-50%
Upper Bound	+50%	+50%	+50%
Participation Levels			
Lower Bound	-10% for Load Management -20% for All Other Programs	-50%	-50%
Upper Bound	+10% for Load Management +20% for All Other Programs	+50% to 5 times times Point Estimates	+50% to 5 times Point Estimates
Dependency Coefficient w/Aggregate Forecast	1.0 for Load Management 0 for Other Programs	-1.0 for Electrification 1.0 for All Other Programs	1.0 for Electrification 1.0 for All Other Programs
Aggregate Electricity Forecast[a]			
Lower Bound	-2%	1.1% Annual Growth After 1990	0 Growth After 2000
Upper Bound	+2%	2.7% Annual Growth After 1990	2.5% Growth After 2000

(a) The 2010 values are dependent on the 2000 values with a coefficient of 1.0.

Table 4. Overall DSM Impact Estimates: 90% Confidence Interval

	Percent Reductions					
	1990		2000		2010	
	Low	High	Low	High	Low	High
Annual Energy Consumption	0.7%	1.7%	1.0%	9.8%	2.6%	17.4%
Summer Peak Demand	2.8%	4.3%	4.8%	14.3%	7.8%	20.6%
Winter Peak Demand	2.2%	3.7%	3.3%	12.0%	5.3%	17.7%

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