Before the Minnesota Public Utilities Commission
State of Minnesota

In the Matter of the Application of Northern States Power Company
for Authority to Increase Rates for Electric Service in Minnesota

Docket No. E002/GR-12-961
Exhibit___(AF-2)

**Economic and Energy Efficiency Impacts
on
Sales Forecasts**

March 25, 2013

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Schedules

I. INTRODUCTION

1

2

3   Q.   PLEASE STATE YOUR NAME AND TITLE.

4   A.   My name is Ahmad Faruqui. I am a Principal with *The Brattle Group*, located

5   at Suite 2800, 201 Mission Street, San Francisco, California 94105.

6

7   Q.   HAVE YOU PREVIOUSLY PROVIDED TESTIMONY IN THIS PROCEEDING?

8   A.   Yes. I filed Direct Testimony on behalf of Northern States Power Company,

9   doing business as Xcel Energy (Xcel Energy or the Company), in which I

10   explained why sales growth has been declining and why sales growth is likely

11   to stay below levels seen before the recession. I also provided a review of the

12   Company's sales forecasting methodology.

13

14 Q.   WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?

15 A.   My purpose is to rebut certain points made by Minnesota Department of

16   Commerce witness Mr. Adam Heinen in his Direct Testimony. Mr. Heinen

17   states that the Company's Demand-Side Management (DSM) adjustment is

18   unnecessary and needs to be removed. I disagree with this assessment.

19

20 Q.   PLEASE SUMMARIZE YOUR RECOMMENDATIONS.

21 A.   I believe that the Company's DSM adjustment is valid, reasonable, and

22   consistent with best industry practice. I recommend that the Company

23   continue to make a DSM adjustment and that it continue to use a five-year

24   average to calculate the embedded DSM impacts, rather than the shorter four-

25   year period suggested by Mr. Heinen.

26

II. EVALUATION OF COMPANY'S DSM ADJUSTMENT

Q. MR. HEINEN RECOMMENDS THAT THE COMPANY ELIMINATE ITS EXOGENOUS DSM ADJUSTMENT TO ITS SALES PROJECTIONS. DO YOU AGREE?

A. No, I do not.

Q. WHY DOES XCEL ENERGY NEED TO MAKE A DSM ADJUSTMENT IN ITS ESTIMATION OF TEST-YEAR SALES?

A. The Company's goal is to quantify the effect of DSM programs on electric sales that are not already accounted for in its sales forecasting models. The Company's sales forecast inherently reflects an amount of embedded DSM based on historical DSM achievements. The DSM adjustment only estimates incremental reductions in electricity sales that go beyond historical program levels. The Company's Conservation Improvement Program (CIP) has had a significant impact, reducing sales annually by an average of 362 GWh during the years 2007-11. These reductions must be fully accounted for in a projection of sales. Thus, it is necessary to make an exogenous adjustment outside of the sales forecasting model.

Q. CAN YOU SUMMARIZE THE COMPANY'S DSM ADJUSTMENT METHODOLOGY?

A. The DSM adjustment is the difference between the sales reduction resulting from planned, future DSM achievements and the DSM-related sales reduction trend carried forward in the forecast. For instance, if historical DSM achievements have resulted in a one percent sales reduction on average per year in the historical data, this one percent downward sales trend is implicitly carried forward in the forecast. If the future DSM achievements are expected

1   to be 1.5 percent of sales per year, the DSM adjustment will be limited to the

2   difference between expected future DSM achievements and past

3   achievements, or a 0.5 percent additional sales reduction in this example.

4

5   **A.   Industry Best Practices**

6   Q.   DO OTHER COMPANIES MAKE SIMILAR ADJUSTMENTS FOR DSM OUTSIDE

7   THEIR LOAD FORECASTS?

8   A.   Yes, most utility companies use an exogenous adjustment to reflect the impact

9   of DSM programs in their sales forecasts. Companies use a variety of

10   different methods to estimate DSM impacts. Some companies rely on

11   engineering-based analysis, some rely on expert judgment, and some rely on

12   statistical measurement and verification studies to estimate DSM impacts. But

13   regardless of how the DSM impacts are estimated, a separate adjustment is

14   made for these impacts outside of the sales forecasting model. There are only

15   two occasions when an adjustment is not warranted: (a) there is no history of

16   DSM and no projection of DSM or (b) the level of DSM has stayed constant

17   in the past and is expected to stay constant in the future. Neither of these

18   scenarios is true for the Company's test year.

19

20   Q.   WHAT ARE THE MAIN METHODS OF ADJUSTING FOR DSM?

21   A.   There are three methods for adjusting sales to account for DSM impacts. The

22   most common method is the one that the Company has used: incremental

23   DSM savings that are not embedded in historical sales are subtracted from

24   forecasted sales. The second method is where companies add back in the

25   exogenously estimated historical DSM impacts to historical sales to come up

26   with what sales would have been had DSM not occurred. Their econometric

27   sales forecasting model is then estimated over this reconstructed data series.

1   This model predicts a future that does not have DSM in it. To forecast sales

2   net of DSM, these companies subtract the full value of the projected DSM

3   impacts from their model forecasts. In the third and final method, companies

4   use some measure of DSM programmatic activity as an explanatory variable in

5   their sales forecasting models. This third approach is empirically difficult to

6   implement.

7

8   Q. DR. FARUQUI, HAVE YOU HAD A CHANCE TO VALIDATE THE USE OF THESE

9   THREE ALTERNATIVES WITH FORECASTING PRACTITIONERS IN THE

10   ELECTRIC INDUSTRY?

11   A. Yes, I recently queried over a dozen forecasters at utilities in the United States

12   and Canada to determine how they account for DSM impacts in their sales

13   forecasts. My inquiries showed that the Company's approach was the most

14   frequently used method.   In other words, utilities most often projected

15   incremental impacts from DSM (above those impacts already embedded in

16   historical sales) and then subtracted those incremental impacts from sales

17   projections.

18

19   Q. ARE YOU AWARE OF ANY SURVEYS OF UTILITY APPROACHES TO DSM

20   ADJUSTMENTS?

21   A. Yes, Hydro One Networks (Hydro One) carried out a survey in April 2011.[1]

22   Hydro One is a wholly-owned subsidiary of Hydro One Inc. in the Canadian

23   province of Ontario, involved in the planning, construction, operation and

24   maintenance of the company's transmission and distribution networks.   A

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[1] Hydro One Networks, "Business Load Forecast Methodology: Attachment 1, Appendix D," 2013/2014 Transmission Revenue Requirement & Rate Application to the Ontario Energy Board, (Docket No. EB-2012-0031, Exhibit A-15-02), filed May 28, 2012, http://www.hydroone.com/RegulatoryAffairs/Documents/EB-2012-0031/Exhibit%20A/A-15-02.pdf (accessed March 5, 2013).

1   copy of the survey results have been provided as Exhibit___(AF-2), Schedule

2   1.

3

4   Q.   CAN YOU DESCRIBE THE SURVEY ADMINISTERED BY HYDRO ONE?

5   A.   Hydro One administered a web-based survey in order to better understand the

6   methodologies used to incorporate DSM in load forecasting; in addition,

7   Hydro One wanted to understand which categories of DSM are incorporated

8   in these methodologies.   Hydro One sent the survey to one hundred

9   organizations in North America and a total of 41 organizations responded,

10   including both Canadian and U.S. utilities.

11

12   Q.   WHAT DID HYDRO ONE'S SURVEY FIND?

13   A.   The survey found that the Company's approach was the most frequently used.

14   The second most common approach was one where historical DSM program

15   savings were added back in to actual historical sales and an econometric model

16   was then estimated over this reconstituted data. This model was then used to

17   forecast sales that are "gross" of DSM. The full impacts from future DSM

18   programs were then subtracted from the gross sales forecasts in order to get a

19   projection of electric sales that are net of DSM impacts.   Of the 41

20   respondents to the survey, 75 percent of respondents accounted for DSM

21   using an implicit methodology such as that of the Company, 20 percent

22   accounted for DSM using an explicit methodology such as the gross-up

23   methodology, and five percent of respondents did not reflect DSM in their

24   load forecasts.

25

1 Q. ARE YOU AWARE OF ANY OTHER SURVEYS?

2 A. Yes, another survey was conducted by Duke Energy in January 2011. Duke

3   Energy surveyed 23 members of the Edison Electric Institute (EEI) on the

4   methods they use to incorporate the impact of energy efficiency programs on

5   load forecasts.[2]

6

7 Q. WHAT WERE THE RESULTS OF THE DUKE SURVEY?

8 A. Of the 23 organizations surveyed by Duke Energy, the most frequent type of

9   method to account for energy efficiency impacts was similar to that of the

10   Company; 17 of the 23 respondents (74 percent) used variations of an implicit

11   methodology. Of the remaining six respondents, three respondents (13

12   percent) used an explicit methodology to estimate energy efficiency impacts

13   on load forecasts, while the other three respondents (13 percent) did not

14   account for DSM in their load forecasts.

15

16 Q. HOW CONSISTENT ARE THE SURVEYS?

17 A. The results of the two industry surveys carried out in early 2011 and my recent

18   inquiries are quite consistent. These results point to the fact that most utilities

19   account for DSM impacts in their sales forecasts. Of those that account for

20   DSM, the vast majority make exogenous adjustments to their sales forecasts to

21   account for DSM program impacts, just like the Company has done in this

22   filing. In addition, some other utilities employ the other approaches

23   previously mentioned in my testimony in order to estimate the impact of DSM

24   programs on utility electric retail sales.

25

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[2] The Duke Energy survey is discussed in the Hydro One Study.

1   **B.   Period Used to Calculate Embedded DSM**

2   Q.   MR. HEINEN IS PROPOSING THAT THE COMPANY REDUCE THE PERIOD

3   OVER WHICH TO AVERAGE DSM FROM FIVE TO FOUR YEARS. DO YOU

4   AGREE?

5   A.   No, I do not.

6

7   Q.   WHY IS THE FIVE-YEAR AVERAGE OF THE DSM PERIOD A BETTER ESTIMATE

8   FOR EMBEDDED DSM IMPACTS THAN MR. HEINEN'S SUGGESTED FOUR-

9   YEAR AVERAGE?

10   A.   The Company takes the five-year average of the most recent first-year DSM

11   program savings[3] in order to create an estimate of the impact existing DSM

12   programs achievements will have on future sales. By cutting the length of the

13   period from five to four years, one would get a less representative estimate of

14   the amount of DSM that is reflected in the historical sales data. Because the

15   historical data used to estimate the sales forecasting models extend back to

16   1998, where the Company's DSM impacts were significantly lower than in the

17   four years since the Next Generation Energy Act (NGEA) was passed, I

18   believe that taking the four-year post-NGEA time period would overestimate

19   the amount of DSM accounted for in the historical data. Moreover, I have

20   been advised by the Company that the weighted average life of its CIP

21   measures is 14 years, almost three times the five-year period used in this

22   calculation. I believe that the Company's five-year average calculation of

23   embedded DSM impacts is conservative as is, and if anything, the Company

24   should consider extending the estimation window for calculating embedded

---

[3] First-year DSM program savings refers to the energy savings expected in the 12-month period following installation of a new DSM measure. For example, a LED bulb is estimated to save 35 kWh each year over its 20-year expected life, for a total lifetime savings of 700 kWh. In this example, only the first-year savings of 35 kWh would be used when calculating the five-year average of DSM achievements.

1   DSM impacts in order to get an estimate that would cover a greater number of

2   the years for which data is used in its sales models.

3

4   **III. OTHER DOWNWARD PRESSURES ON SALES GROWTH**

5

6   Q.   ARE THERE ANY OTHER DOWNWARD PRESSURES ON SALES GROWTH

7   BEYOND WHAT THE COMPANY'S FORECASTING METHODOLOGY REFLECTS?

8   A.   Yes. As mentioned in my Direct Testimony, there are several factors that are

9   slowing down electricity sales growth besides DSM programs. These include

10   the weak economic recovery and government codes and standards. There are

11   also certain intangible factors, such as a relative decline in consumer

12   sentiment, that influence utility sales but simply cannot be captured in a

13   quantitative model. If they were included, they would result in a lowering of

14   the sales forecast. In this respect, the Company's estimates for declining sales

15   growth are conservative.

16

17   Q.   WHAT HAS THE RECENT ECONOMIC RECOVERY IN THE UNITED STATES

18   LOOKED LIKE?

19   A.   While the economy has shown recent signs of improvement, growth remains

20   modest. According to the Bureau of Economic Analysis, real gross domestic

21   product (GDP) increased by approximately 0.1 percent in the fourth quarter

22   of 2012 and by 2.2 percent for the year as a whole.[4] So far, this modest

23   recovery has continued into January and February of 2013. While the

24   unemployment rate in February decreased from 7.9 percent to 7.7 percent as

25   nonfarm payroll employment increased by 236,000, net improvement since

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[4] U.S. Bureau of Economic Analysis, "GDP Growth Slows in Fourth Quarter," February 28, 2013,
http://www.bea.gov/newsreleases/national/gdp/gdphighlights.pdf.

1 September 2012 has been minor.[5] However, some of the decrease in the

2 unemployment rate from January to February can be attributed to the

3 increased number of discouraged workers (885,000 in February as compared

4 to 804,000 in January) leaving the workforce. The civilian labor force

5 participation rate of 63.5 percent has also decreased 0.1 percent from a month

6 earlier and 0.4 percent from a year earlier.[6] While increasing property values

7 and a boost in consumer spending point to future improvement in the

8 economy, many countervailing forces prevent the economy from really kicking

9 into gear.   Due to the federal budget sequestration, the IMF has announced

10 that it will revise its estimate of 2013 growth of two percent[7] downward by as

11 much as 0.5 percent, which could result in weaker growth in the United States

12 than in 2012.[8]

13

14 Q. WHAT OTHER FACTORS ARE NEGATIVELY AFFECTING THE ECONOMY?

15 A. Gridlock over how to resolve the federal budget deficit, increases in payroll

16 taxes, the federal budget sequestration that will result in $85 billion of

17 spending cuts between March 1 and September 30, a continued elevated

18 unemployment rate, and higher gasoline prices are all major factors negatively

19 affecting the economy. All of these factors create uncertainty over the

20 economy, thus depressing consumer expenditures.

21

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[5] U.S. Bureau of Labor Statistics, "The Employment Situation – February 2013," March 8, 2013, http://www.bls.gov/news.release/pdf/empsit.pdf.

[6] *Id.,* 2.

[7] "World Economic Outlook Update: Gradual Upturn in Global Growth During 2013," *International Monetary Fund,* January 23, 2013, http://www.imf.org/external/pubs/ft/weo/2013/update/01/pdf/0113.pdf.

[8] Sandrine Rastello, "IMF Says It Will Lower U.S. Outlook Because of Sequestration," *Bloomberg,* February 28, 2013, http://www.bloomberg.com/news/print/2013-02-28/imf-says-it-will-lower-u-s-outlook-because-of-sequestration-1-.html (accessed March 7, 2012).

1   Q.   WHAT HAS BEEN THE STATE OF MINNESOTA'S ECONOMIC RECOVERY THUS

2   FAR IN 2013?

3   A.   Similar to the nation as a whole, Minnesota has shown signs of modest growth

4   so far in 2013. According to the recent Federal Reserve Beige Book, which

5   summarizes current economic conditions through reports from Bank and

6   Branch directors and other contacts such as economists and market experts,

7   wage increases in the Ninth District—Minneapolis remained moderate and

8   real-estate markets continue to strengthen as home sales are up.[9] However,

9   gasoline prices in the state of Minnesota have gone up almost 80 cents per

10   gallon compared to the middle of January, which could cut into disposable

11   income.[10]

12

13   Q.   WHAT IS THE STATE OF CONSUMER SENTIMENT ABOUT THE ECONOMY?

14   A.   According to the latest figures released by Thomson Reuters and the

15   University of Michigan, the preliminary estimate for consumer sentiment in

16   March has dropped to 71.8 from 77.6 in February, its lowest level since

17   December 2011.[11] The index remains considerably lower than the levels seen

18   before the recession, approximately 19 percent lower than the five-year pre-

19   recession average of 89.[12] Much of this decline in sentiment can be attributed

20   to views of government economic policy. According to survey director

21   Richard Curtin, "the frustrations expressed by consumers essentially involve

[9] Board of Governors of the Federal Reserve System, "Summary of Commentary on Current Economic Conditions by Federal Reserve District: February 2013," (2013).

[10] *Id.,* IX-3.

[11] Leah Schnurr, "Consumer sentiment hit by policy concerns in March," *Reuters*, March 15, 2013, http://www.reuters.com/article/2013/03/15/us-usa-economy-sentiment-idUSBRE92E0M120130315 (accessed March 15, 2013).

[12] Direct Testimony of Ahmad Faruqui, before the Minnesota Public Utilities Commission State of Minnesota, in the matter of *The Application of Northern States Power Company for Authority to Increase Rates for Electric Service in Minnesota,* Docket No. E002/GR-12-961, November 2, 2012.

1   how little consideration has been given to how the government's inability to

2   reach a compromise affects people's economic situation."[13]   I expect lower

3   levels of confidence in the economy to continue to depress consumption of

4   electricity, as consumers are more hesitant to draw down on their savings and

5   spend on consumer goods and services in the face of economic uncertainty.

6

7   Q.   DID THIS FACTOR GET CAPTURED IN THE COMPANY'S LOAD FORECAST?

8   A.   It is very difficult to quantify consumer expectations and consumer sentiment

9   in any load forecasting model, especially if these factors have only acquired

10   prominence in the last few years of the estimation window. The Company's

11   load forecasting model has been over-forecasting sales for the last five years.

12   From 2007-2011, the Company's forecasts for the next year were overly

13   optimistic by 1.9 percent on average when compared to actual sales adjusted

14   for weather.[14] I suspect that some of this over-forecasting may be due to the

15   drop in consumer sentiment.

16

17   **IV. CONCLUSION**

18

19   Q.   PLEASE SUMMARIZE YOUR TESTIMONY.

20   A.   I believe that the Company's Demand-Side Management adjustment

21   mechanism is valid, reasonable, and consistent with best industry practice.

22   The Company's adjustment mechanism is in fact the most frequently used

23   adjustment in the industry. Overall, I believe the Company's estimates of a

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[13] Schnurr, "Consumer sentiment hit by policy concerns in March."
[14] Direct Testimony of Jack S. Dybalski, before the Minnesota Public Utilities Commission
State of Minnesota, in the matter of *The Application of Northern States Power Company
for Authority to Increase Rates for Electric Service in Minnesota,* Docket No. E002/GR-12-961, November 2,
2012.

1   decline in sales growth is accurate and possibly an understatement of what will

2   probably take place, not only due to the DSM adjustments it has made but

3   also due to several other factors that are difficult to reflect in sales forecasting

4   models, but which nonetheless further lower sales.

5

6   Q.   DOES THIS CONCLUDE YOUR TESTIMONY?

7   A.   Yes, it does.

Appendix D

CDM Load forecasting Survey Results and Questionnaire

Survey Results

EXECUTIVE SUMMARY

In April 2011, Hydro One launched a web-based survey to selected North American electricity utilities to better understand the methodologies used to incorporate Conservation & Demand Management (CDM), also known as Demand Side Management (DSM) in the USA, into load forecasting.

A total of 41 organizations responded to this survey. An excellent response rate of about 41% was achieved with responses were received from jurisdictions within Ontario, from several other Canadian provinces, and from across the United States.

The following is a summary of the survey findings:

- Respondents were primarily Integrated Utilities and Distributors.

- The majority of respondents (~ 60 percent) reported a peak demand of less than 10,000 MW in 2010.

- 20 percent of respondents said that they use an explicit methodology to incorporate CDM/DSM in their load forecast. 75 percent of these said that it was the best methodology available.

- 75 percent said that CDM/DSM is incorporated in the load forecast using an implicit methodology. 45 percent of these said that it was the best methodology available.

- The most common mechanism to recover lost revenue due to CDM/DSM was cost of service.

- The current CDM/DSM categories currently used by Hydro One (energy efficiency programs, appliance and lighting standards, building codes, demand response, time-of-use or dynamic pricing, and customer conservation actions) were commonly recognized among the respondents, regardless of forecasting methodology.

- The methods used to forecast these methodologies varied by category and by utility.

- Spillover and free-driver effects, free-rider effects, and persistence of savings were all commonly accounted for in the load forecast.

- The majority of respondents (59 percent) said that natural conservation was taken into account in their load forecast methodology. The definitions given for natural conservation suggested that the definition of this term varies among the respondents.

- Those who said they did not incorporate natural conservation commonly said that it was already embedded in the historical data.

D.1 Introduction

In an effort to better understand the methodologies by which North American electric utilities incorporate CDM/DSM into their load forecasting, Hydro One developed a short, web-based survey. The survey was launched in April 2011 to selected companies across North America.

The main objectives of the survey were to determine the methodologies used by other utilities to incorporate CDM/DSM into the load forecast and to also better understand which categories of CDM/DSM are incorporated via this methodology. There are two methodologies commonly in use in North America. The first is an implicit methodology where by data is used to generate the load forecast with past conservation impacts embedded, then future incremental efficiency program savings are subtracted from the forecast. The second is an explicit methodology where the historical efficiency program savings are first added back to the actual load then all past and future efficiency savings are subtracted from the forecast. Hydro One currently uses an explicit methodology to incorporate CDM/DSM in its load forecast.

A total of 41 organizations responded to this survey. Responses were received from jurisdictions within Ontario, from several other Canadian provinces, and from across the United States.

D.2 Results

What are your primary business activities?

There were 41responses to this question.

- 46% of respondents were from integrated utilities (generation, distribution and transmission services)

- 24% of respondents were from distribution companies

Primary Business Activities

Dx and Tx, 2

Distribution Only, 10

Integrated Utility, 19

Other, 4

Generation and Dx, 5

Generation Only, 1
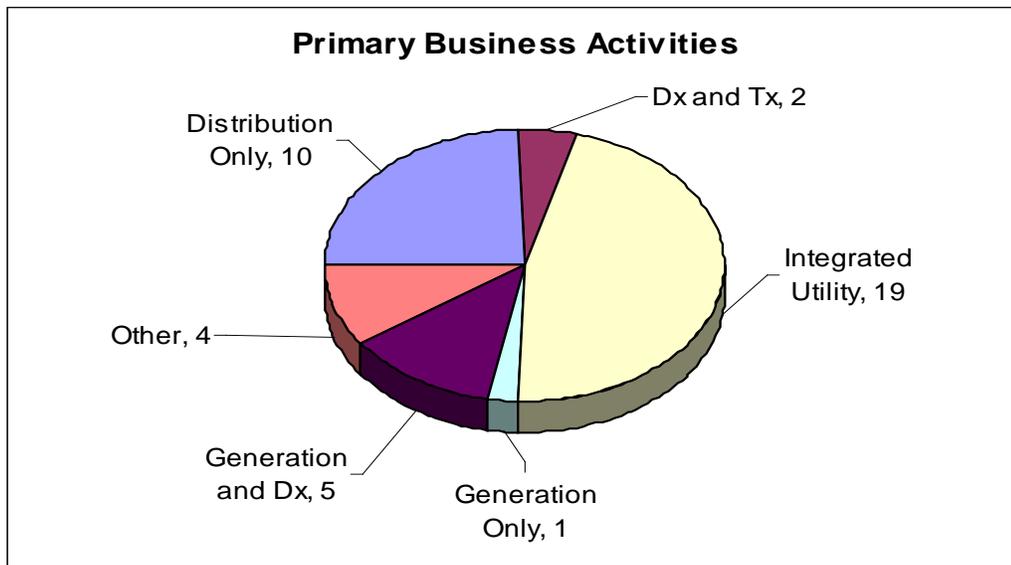
What were your total electricity sales (in MWh) in 2010?

There were 34 responses to this question.

- Answers ranged from 30,485 MWh to 196,592,052 MWh.

What was your customers' or company's total peak demand (in MW) in 2010?

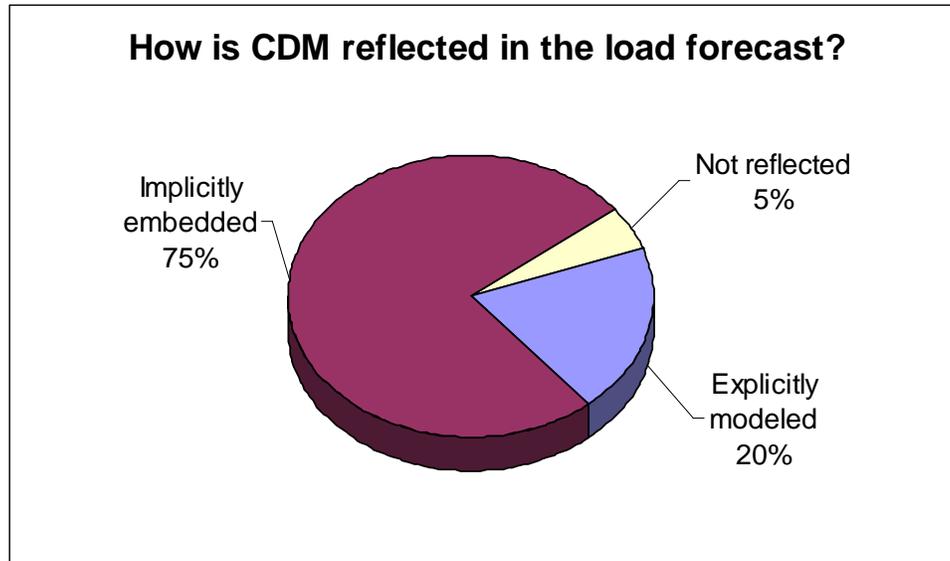There were 37 responses to this question.

- Answers ranged from 707 MW to 47,500 MW.

- About 60% of respondents had peak demand of less than 10,000 MW in 2010.

	Definition	Number
Small	Less than 10,000 MW	22
Medium	10,000 to 20,000 MW	5
Large	More than 20,000 MW	9
No Answer	N/A	5

45

How is the impact of CDM/DSM reflected in your load forecasting?

There were 41 responses to this question.

- 75% of respondents said that CDM was reflected in the load forecast using and implicit methodology.

- 20% said that CDM was explicitly modeled in the load forecast.

- 5% of respondents said they did not reflect CDM in their load forecast.

How is CDM reflected in the load forecast?

Implicitly embedded 75%

Not reflected 5%

Explicitly modeled 20%

What is the rationale for the current methodology used to incorporate CDM/DSM in the load forecast?

There were 39 responses to this question. Respondents were able to respond to this question with more than one answer so as a result the numbers in the graph add up to more than 39.

- 20 respondents said that the current methodology was the best available.

- 13 respondents said that it was the most practical.

- 6 respondents said that it was the method recommended by their Regulator.

Rationale for Current Methodology to incorporate CDM

Other, 7

Best Available, 20

Recommended by Regulator, 6

Most Practical, 13
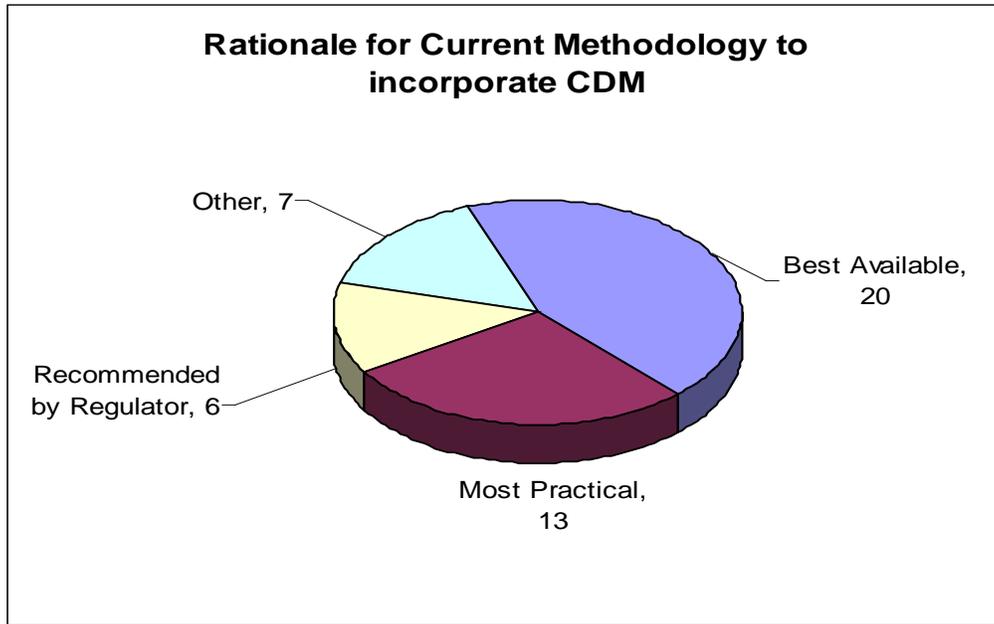
Additional notes:

- o Of respondents using an explicit methodology, 75% said it was the best method available.

- o Of respondents using an implicit methodology, 45% said it was the best method available.

What are the regulatory mechanisms for your company to recover lost revenue due to CDM/DSM **programs?**

There were 37 responses to this question. Respondents were able to respond to this question with more than one answer.

- 14 respondents said they use cost of service to recover lost revenue due to CDM/DSM programs.

- 10 respondents use a Lost Revenue Adjustment Mechanism (LRAM).

- 9 respondents use revenue decoupling.

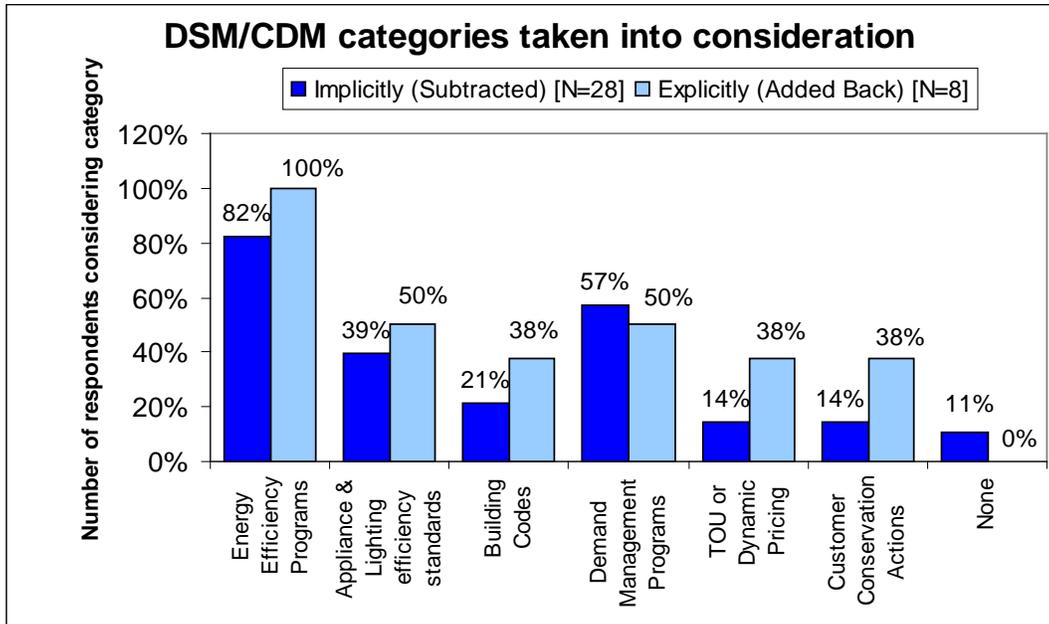**Regulatory Mechanism to recover lost revenue due to CDM**
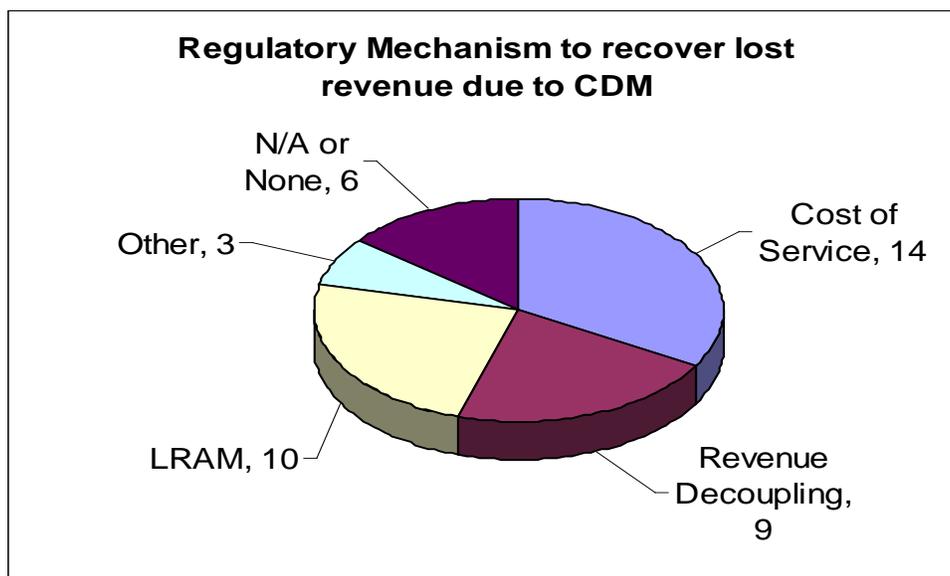
Additional notes:

- 2 respondents used both cost of service and revenue decoupling.

- 1 respondent used cost of service, revenue decoupling and LRAM.

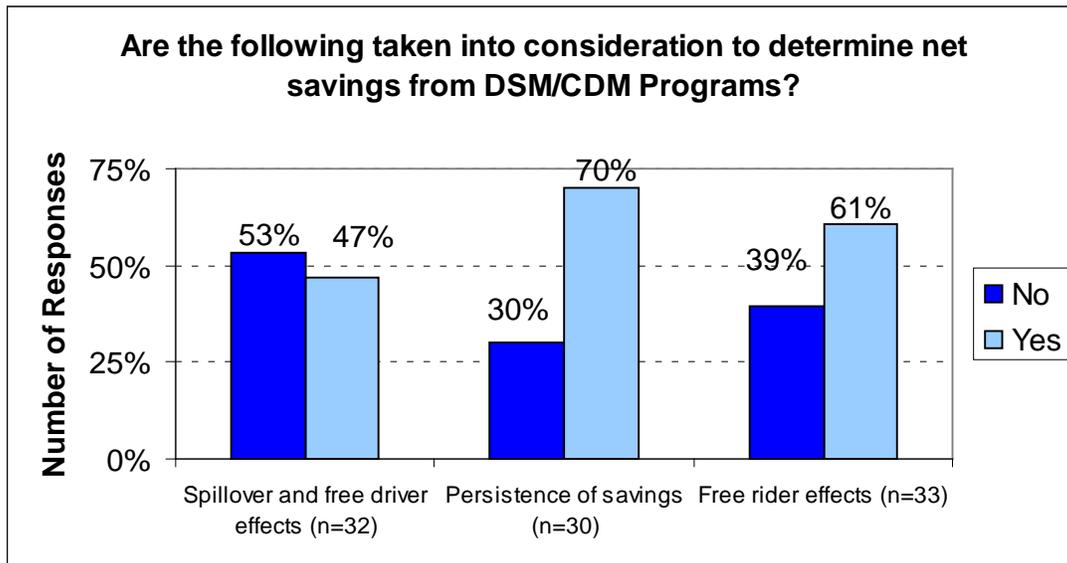**What DSM/CDM Categories are taken into consideration in the load forecast?**

There were 36 responses to this question. Respondents were asked to select all that apply.

- All categories seem to be commonly recognized, regardless of forecasting methodology.

- The most common category considered was Energy Efficient Programs (82% of implicit and 100% of explicit considered this category)

- Demand Management Programs (57% of implicit and 50% of explicit) and Appliance & Lighting Efficiency Standards (39% of implicit and 50% of explicit) were also very commonly considered.

DSM/CDM categories taken into consideration

■ Implicitly (Subtracted) [N=28]　□ Explicitly (Added Back) [N=8]

Number of respondents considering category

Category	Implicitly	Explicitly
Energy Efficiency Programs	82%	100%
Appliance & Lighting efficiency standards	39%	50%
Building Codes	21%	38%
Demand Management Programs	57%	50%
TOU or Dynamic Pricing	14%	38%
Customer Conservation Actions	14%	38%
None	11%	0%

How do you determine net savings from CDM/DSM programs?

Are the following taken into consideration to determine net savings from DSM/CDM Programs?

1. Spillover and Free-Driver Effects

   - 32 respondents answered this question.

   - 53% said that they take spillover and free-driver effects into consideration when determining net savings from CDM/DSM programs.

   - Estimation methods given included econometrics, surveys, billing analysis, and estimates by consultants.

   - Rationale given for estimation methods included best judgment and internal decisions.

2. Persistence of Savings

   - 30 respondents answered this question.

   - 70% said that they take persistence of savings into consideration when determining net savings from CDM/DSM programs.

   - Estimation methods given included econometrics, surveys, engineering calculations and equipment life assumptions.

   - Rationale given for estimation methods included best judgment, internal decisions, and regulator recommendation.
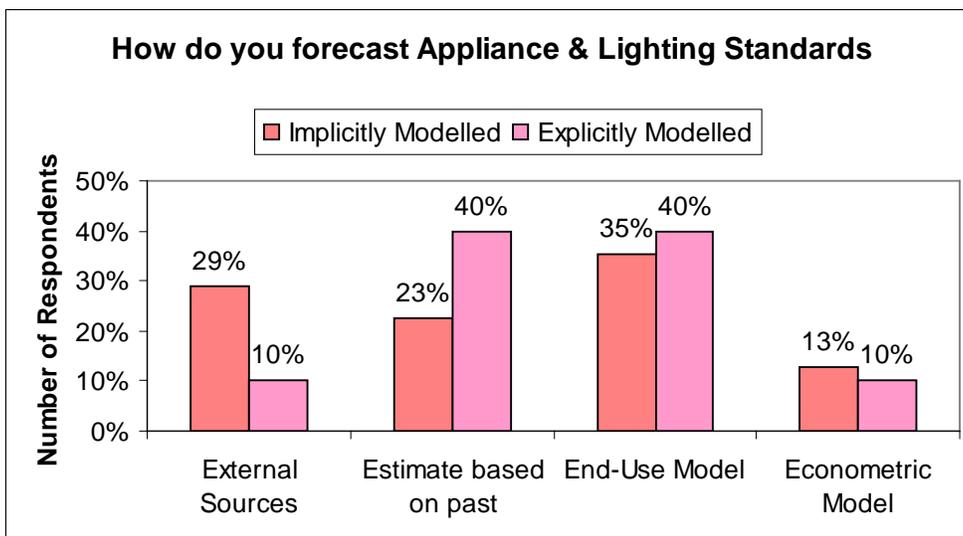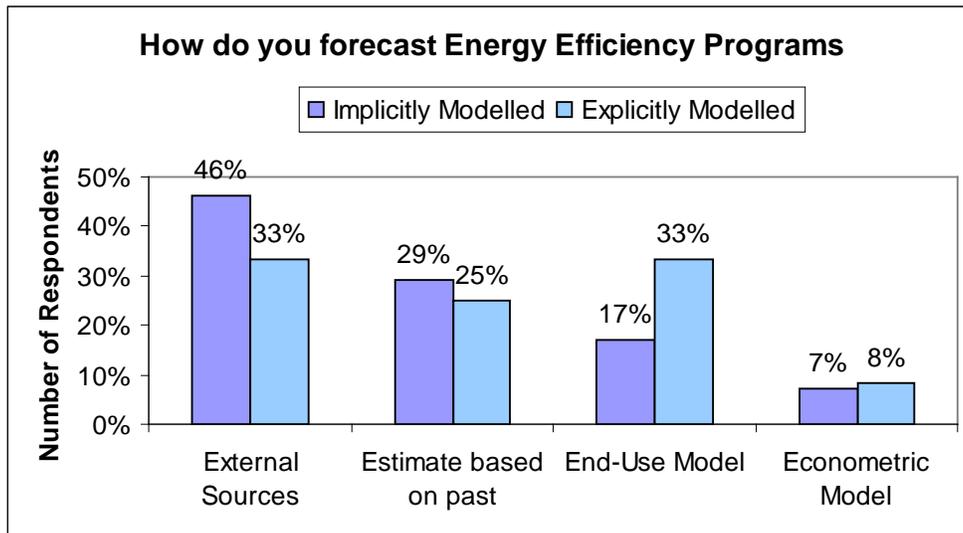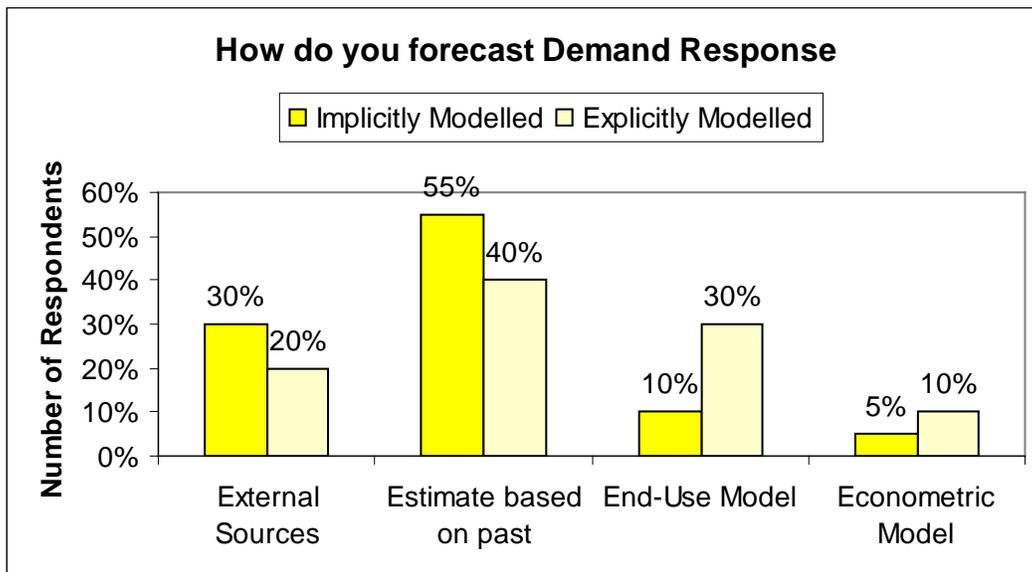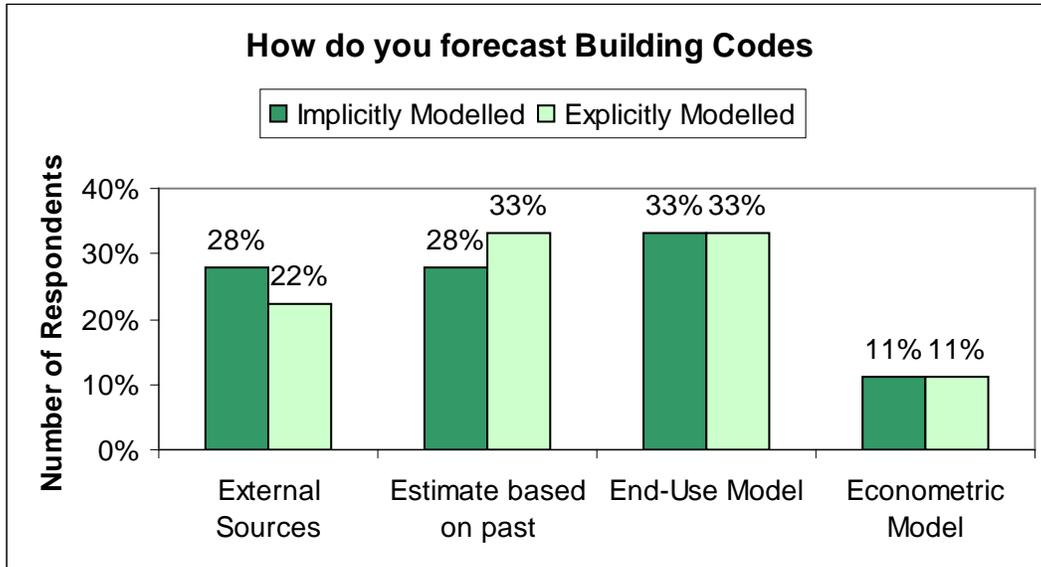
3. Free Rider Effects

   - 33 respondents answered this question.

   - 61% said that they take free-rider effects into consideration when determining net savings from CDM/DSM programs.
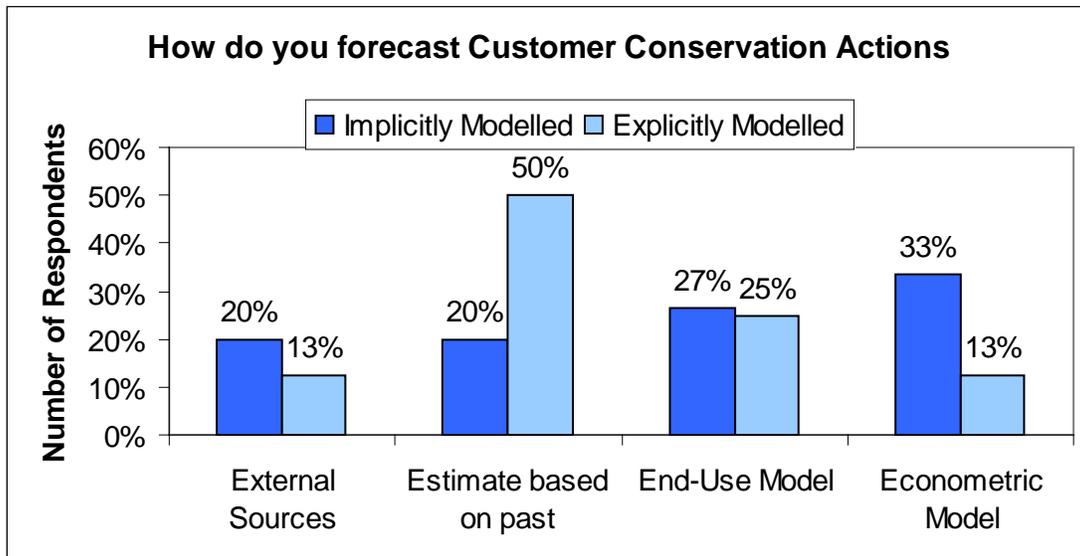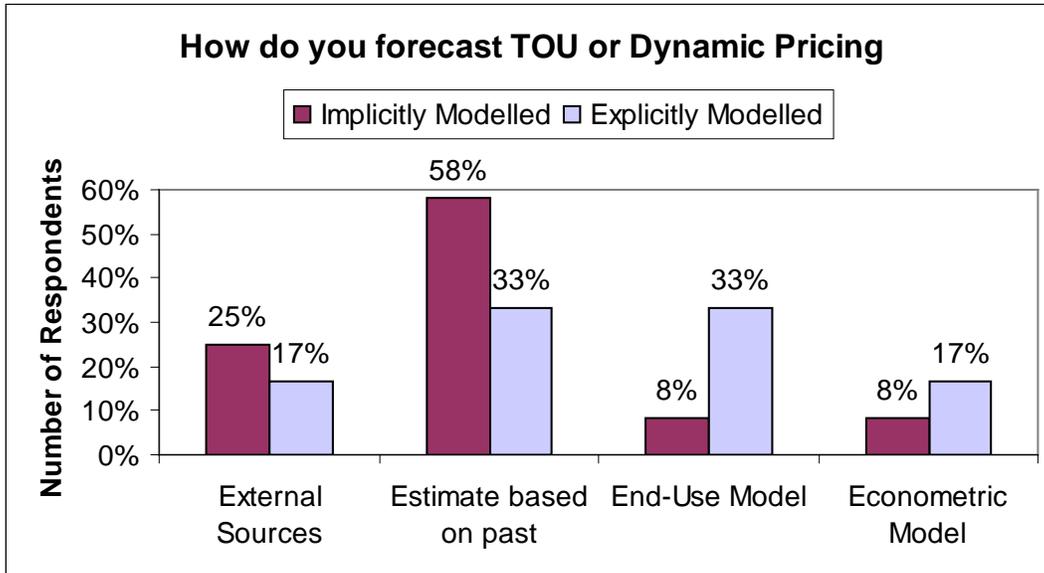
- Estimation methods given included econometrics, surveys, EM&V, program participation and past experience.
- Rationale given for estimation methods included best judgment, internal decisions, and regulator recommendation.

What are your methods used to FORECAST the following CDM/DSM categories?

This question was asked to both implicit and explicit methodologies. The methods used varied across methodology and category.

How do you forecast Building Codes

■ Implicitly Modelled ☐ Explicitly Modelled

How do you forecast Demand Response

☐ Implicitly Modelled ☐ Explicitly Modelled

52

How do you forecast TOU or Dynamic Pricing
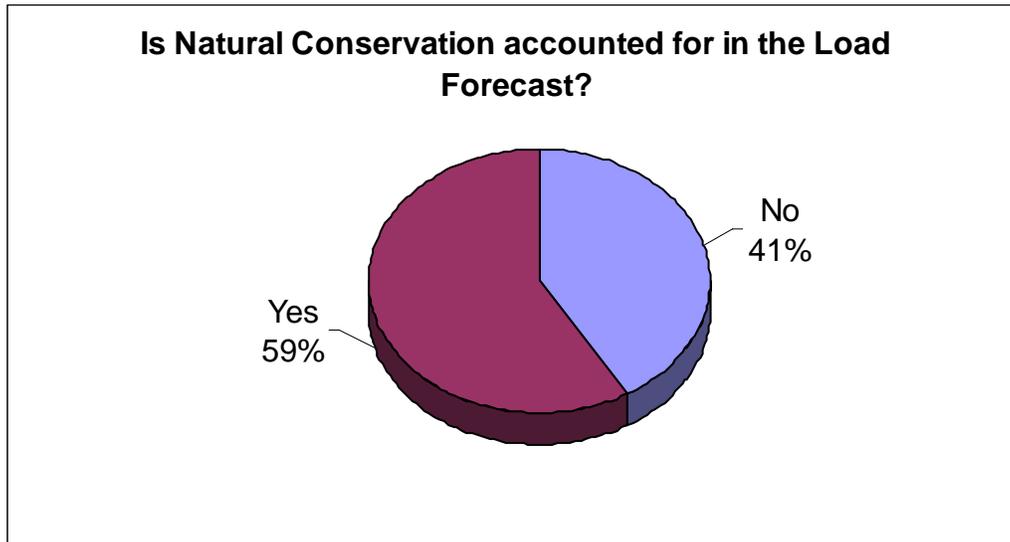

How do you forecast Customer Conservation Actions

Is Natural Conservation accounted for in your load forecasting?

There were 41 responses to this question.

- 59% of respondents said that natural conservation was accounted for in their load forecast.

Is Natural Conservation accounted for in the Load Forecast?

No 41%

Yes 59%

Please explain your definition of "natural conservation" and the estimation methods used in your forecasting.

There were 30 responses to this question. There was a variety of answers received demonstrating that the definition of this term is not common among all respondents.

Some typical answers are shown below:

- Natural conservation is the behavior of customers to reduce energy usage without any utility or government incentive to do so. It is embedded in the historical trends.

- Natural conservation is assumed to be driven by future codes and standards and is based on some judgmental trend in future unit energy consumption by end -use.

- These are the reasonably expected improvements in efficiencies within the end-uses that we forecast.

- Natural conservation is non-program incentivized conservation due to prices, technology changes (i.e., unavailability of less efficient equipment in the market) and social, political and personal restraints. Natural conservation is embedded in the historical data.

Please tell us any other assumption that may be used in your load forecasting methodology.

There were 17 responses to this question. Listed below are a few responses:

- The impact of renewable distributed generation has become the most rapidly growing aspect of customers' conservation efforts in our territory. Data is obtained from applications filed with the utility and assumptions about operating hours, etc. from historical experience are used to develop impacts that are added back to historical data then removed and future impacts subtracted from the forecast.

- We use SAE (Statistically Adjusted End Use modeling)--Heating, cooling and other index

- Utilities must be careful to clearly distinguish between CDM/DSM savings and natural conservation in netting off CDM/DSM from load forecasts. This should be done with a detailed end use by end use accounting.

- CDM/DSM measures such as energy efficiency, demand response, and conservation are implicitly assumed to occur at the same rate as historical trends.

D.3 Comparison of Survey Results

Duke Energy conducted a survey in January 2011 to members of the Edison Electric Institute (EEI) to explore the various methods used to incorporate the load reductions due to energy efficiency programs into load forecasts.[1] While this survey asked specifically about energy efficiency programs and the load forecast, the results are similar to those from Hydro One's survey in terms of forecasting methodology. The survey had 23 respondents with 3 stating they use an explicit model to incorporate the impacts from energy efficiency programs and another considering using the methodology. Three said they do not make reductions for energy efficient programs. The remainder used different variations of an implicit methodology. The survey found that, in general, utilities either subtract energy efficiency program impacts directly from the load forecast or they are captured through the econometric model.

Table 14: Comparison of the survey results

Methodology to Incorporate DSM/CDM in Load Forecast	Hydro One Survey April 2011	Duke Energy Survey January 2011
Implicit methodology	75%	74%
Explicit methodology	20%	13%
Do not incorporate	5%	13%

D.4 Conclusions

Based on the results of 41 survey responses from North American electric utilities, the current methodology used by Hydro One to incorporate CDM/DSM into the load forecast is commonly used. The CDM categories used by Hydro One (energy efficiency programs, appliance and lighting standards, building codes, demand response, time-of-use or dynamic pricing, and customer conservation actions) were recognized by the majority of respondents regardless of the methodology for incorporating the category in the load forecast.

Survey Questionnaire

1. What are your primary business activities? (Please check one)

☐ Electricity Generation

☐ Electricity Transmission

☐ Electricity Distribution

☐ Integrated Utility (Generation, transmission, distribution)

☐ ISO/ IESO

☐ Commission or Government Agency

☐ Other

Please explain in more detail where necessary.

2. What were your total electricity sales (in GWh) in 2010?

3. What was your customer's or company's total peak demand (in MW) in 2010?

4. How is the impact of DSM/CDM reflected in your load forecasting? (Please check one)

A. Explicitly modeled in the load forecast (e.g., add historical efficiency program savings back to actual load and then deduct all past and future efficiency savings from the forecast).

B. Implicitly embedded in the load forecast (e.g., data used to generate the forecast has past conservation impacts embedded, subtract future incremental efficiency program savings from the forecast).

C. Not reflected in the load forecast

D. Other (please specify):

5. What is the rationale for the current methodology used to incorporate DSM/CDM in the load forecast? (Check all that apply)

❑ Recommended/approved by Commission/Government Agency/Regulator

❑ Believe that it is the best methodology to prepare an accurate load forecast

❑ It is the most practical method for our utility even though it may not be the best one.

❑ Other (please specify):

6. What are the regulatory mechanisms for your company to recover lost revenue due to DSM/CDM programs?

☐ Cost of service

☐ Revenue Decoupling

☐ Lost Revenue Adjustment Mechanism (LRAM)

Targets)

☐ Other (please specify):

If SELECT "A " FOR QUESTION 4, THEN CONTINUE Q7, Q8, Q9, Q13, Q14, Q15, Q16

7. What DSM/CDM savings are added back to the historical load to generate the gross load with DSM/CDM? (Check all that apply)

☐Energy efficiency programs

☐ Appliance and lighting efficiency standards

☐ Building codes

☐Demand response

☐Time-of-Use prices or Dynamic Pricing

☐Customer conservation actions (not captured by specific programs, such as turning off lights when it is not in use, turn down thermostat etc.)

☐Other [please specify]

8. What are the methods used to measure the <u>ACTUAL IMPACT</u> for the following DSM/CDM categories? (Check all that apply)

☐Energy efficiency programs

☐ Appliance and lighting efficiency standards

☐ Building codes

☐Demand response

☐Time-of-Use prices or Dynamic Pricing

☐Customer conservation actions (not captured by specific programs, such as turning off lights when it is not in use, turn down thermostat etc.)

☐Other [please specify]

EACH OPTION HAS THE FOLLOWING DROP DOWN LIST

> **EMV (Evaluation, measurement and verification)**
>
> **End use model**
>
> **Econometric model**
>
> **Other (please specify)**

9. What are the methods used to <u>FORECAST</u> the following DSM/CDM categories? (Check all that apply)

☐Energy efficiency programs

☐ Appliance and lighting efficiency standards

☐ Building codes

☐Demand response

☐Time-of-Use prices or Dynamic Pricing

☐Customer conservation actions (not captured by specific programs, such as turning off lights when it is not in use, turn down thermostat etc.)

☐Other [please specify]

EACH OPTION HAS THE FOLLOWING DROP DOWN LIST

External sources (such as State/provincial/utility DSM/CDM Target)
Estimate based on past experience, similar programs or customer base
End use model
Econometric model
Other (please specify)

If SELECT "B" FOR QUESTION 4, THEN CONTINUE Q10, Q11, Q13, Q14, Q15, Q16

10. What DSM/CDM savings are subtracted from the load forecast? (Check all that apply)

☐Energy efficiency programs

☐ Appliance and lighting efficiency standards

☐ Building codes

☐Demand response

☐Time-of-Use prices or Dynamic Pricing

☐Customer conservation actions (not captured by specific programs, such as turning off lights when it is not in use, turn down thermostat etc.)

☐Other [please specify]

11. What are the methods used to <u>FORECAST </u>the following DSM/CDM categories? (Check all that apply)

☐Energy efficiency programs

☐ Appliance and lighting efficiency standards

☐ Building codes

☐Demand response

☐Time-of-Use prices or Dynamic Pricing

☐Customer conservation actions (not captured by specific programs, such as turning off lights when it is not in use, turn down thermostat etc.)

☐Other [please specify]

EACH OPTION HAS THE FOLLOWING DROP DOWN LIST

External sources (ie. State/provincial/utility DSM/CDM Target)
Estimate based on past experience, similar programs or customer base
End use model
Econometric model
Other (please specify)

If SELECT "C " or "D" FOR QUESTION 4, THEN CONTINUE Q12, Q13, Q14, , Q15, Q16

12. How do you account for the DSM/CDM impacts in the load forecast?

13. Natural Conservation

Is natural conservation accounted for in the load forecast?	☐ YES ☐NO
Your definition of natural conservation	**Specify**
Estimation method of natural conservation	**Specify**

14. How do you determine net savings from DSM/CDM programs?

	Is it addressed?	Estimation methods (i.e. survey, billing analysis etc)	Rationale for the estimation methodology (ie, recommended by regulator, commission etc)
Free rider effect	☐ YES ☐NO	**Specify:**	
Spillover and free driver effects	☐ YES ☐NO	**Specify:**	
Persistence of saving	☐ YES ☐NO	**Specify:**	

15. Are there any documents related to the method of incorporating DSM/CDM impact in the load forecast or DSM/CDM assumptions you can share with us? **(UPLOAD FILE OR LINKS)**

_____

16. Would you like to receive the results of this survey?

❑   Yes

❑   No

17. Please provide your contact information:

Last Name: _____

First Name:_____

Company:_____

Email:_____

Phone:_____

Thank you for participating in this survey.