

BEFORE THE
STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

In the Matter of
Consolidated Edison Company Of New York, Inc.
Case 08-E-0539
September 2008

Prepared Testimony of:

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1 Q. Please state your name, employer, and business
2 address.

3 A. My name is Anping Liu. I am employed by the New
4 York State Department of Public Service
5 (Department). My business address is Three
6 Empire State Plaza, Albany, New York.

7 Q. What is your position at the Department?

8 A. I am employed as a Principal Econometrician in
9 the Office of Regulatory Economics.

10 Q. Please describe your educational background and
11 professional experience.

12 A. I received a Bachelor of Science in Mathematics
13 from Shaanxi Normal University in 1982, a Master
14 of Science from Huazhong University of Science
15 and Technology in 1985, and a Ph.D. in Economics
16 with specialties in Industrial Organization and
17 Public Economics from Wayne State University in
18 1991. I joined the Department in 1992.

19 Q. Please briefly describe your current
20 responsibilities with the Department.

21 A. My current responsibilities include developing
22 electric sales forecasts and monitoring the
23 wholesale electric market.

24 Q. Have you previously testified before the New

1 York State Public Service Commission

2 (Commission)?

3 A. Yes. I have testified on sales forecasts,
4 wholesale electricity supply costs, and the
5 economic impact of the increase in the price of
6 electricity.

7 Q. In what previous rate cases have you testified
8 on electric utility sales forecasts?

9 A. I testified in Case 07-E-0523, Consolidated
10 Edison Company of New York, Inc.; Case 05-E-
11 1222, New York State Electric and Gas
12 Corporation; Cases 03-E-0765, 02-E-0198, and 95-
13 E-0673, Rochester Gas and Electric Corporation;
14 and, Case 02-E-1055, Central Hudson Gas and
15 Electric Corporation.

16 Q. What is the purpose of your testimony in this
17 proceeding?

18 A. I will discuss my recommendation regarding the
19 electric sales volume forecast for Consolidated
20 Edison Company of New York, Inc. (Con Edison or
21 the Company).

22 Q. In your testimony, will you refer to, or
23 otherwise rely upon, any information produced
24 during the discovery phase of this proceeding?

- 1 A. Yes. I will refer to, and have relied upon,
2 several responses to Staff Information Requests
3 (IR). The IRs that I have relied upon are
4 included in Exhibit___(AL-1).
- 5 Q. Please summarize Con Edison's sales volume
6 forecast.
- 7 A. Con Edison forecasts that its system
8 transmission and distribution (T&D) sales volume
9 for the rate year ending March 2010 is 59,027
10 Gigawatt hours (GWhs). Con Edison's sales
11 forecast is based on econometric models and
12 reflects projected Demand Side Management (DSM)
13 savings of 1,149 GWhs.
- 14 Q. What is your recommendation for Con Edison's
15 sales volume forecast?
- 16 A. I propose an upward adjustment of 239 GWhs to
17 Con Edison's sales forecast. This adjustment
18 translates into approximately \$12.8 million of
19 additional transmission and distribution
20 revenues for the rate year. I should note,
21 however, that I did not adjust the Company's
22 forecast for sales volume for New York Power
23 Authority (NYPA) customers and customers taking
24 Economic Development Delivery Service (EDDS).

1 Q. In what area did you make your adjustments?

2 A. My sales volume forecast adjustment is derived
3 from my forecast of projected DSM savings that
4 differ from the Company's, which I will explain
5 later in my testimony.

6 Q. Are the Company's sales forecast models
7 generally acceptable?

8 A. Yes. Con Edison's forecasting models are
9 generally acceptable under econometric
10 standards, but I do take issue with certain
11 inputs related to economic variables and weather
12 assumptions.

13 Q. Would you discuss your findings related to the
14 Company's econometric models?

15 A. Con Edison used the econometric models to
16 forecast sales volume for most of its service
17 classes (SC). Sales volume for the largest SCs
18 1, 2, 4, 7, 8, and 9 comprises about 98% of the
19 Company's total sales volume. I take issue with
20 the fact that the Company's residential models
21 for SC 1 and SC 7 do not have personal income as
22 an economic variable. Although Con Edison's SC
23 1 model includes total private non-farm
24 employment as an economic variable, in my view,

1 the personal income variable is the most
2 appropriate economic variable for the
3 residential models. When personal income data
4 is available, it should be included in a
5 residential model.

6 Q. Why should a personal income variable be
7 included in a residential model?

8 A. By economic principles, the energy consumption
9 of residential households is dependent on
10 electricity price and personal income.
11 Residential customer's electricity usage is
12 directly related to their installed appliances.
13 The size of a residential customer's home and
14 ownership of appliances is largely dependent on
15 personal income.

16 Q. Have you developed your own models for these
17 residential service classes?

18 A. Yes. I developed models for SC 1 and SC 7 that
19 contain the personal income estimates as the
20 economic variable. The personal income data and
21 forecast were developed by Moody's Economy.com
22 and provided to me by the Company.

23 Q. How did you use the personal income data from
24 Moody's Economy.com?

- 1 A. The personal income data from Moody's
2 Economy.com is available on an annual basis.
3 It, therefore, needs to be converted into a
4 quarterly series for use in Con Edison's sales
5 forecasting models. This conversion does not
6 result in any variation in the annual series of
7 the original personal income data.
- 8 Q. Have you developed your forecast for any other
9 service class?
- 10 A. Yes. I developed my forecast for SC 2, the
11 small commercial class. My model has the number
12 of SC 1 customers as the economic variable,
13 instead of using employment as an economic
14 variable, which Con Edison's model employs. By
15 replacing employment with the number of SC 1
16 customers, the model's econometric criteria
17 improve. Both goodness of fit and the
18 statistical significance of the economic
19 variable improved. This may be due to the fact
20 that many small businesses in Con Edison's
21 service territory are driven by population.
22 Increasing population creates demand for more
23 goods and services, and thus, more opportunity

1 for more small businesses to open or to expand
2 their businesses.

3 Q. Please discuss your concern related to the
4 Company's weather assumption used in its sales
5 forecast.

6 A. The Company's weather forecast is understated
7 because it is below the normal weather based on
8 the 30-year average of the historical data.

9 Q. Did you address this weather issue in your
10 testimony in Case 07-E-0523?

11 A. Yes, however, in my testimony in this
12 proceeding, I will bolster and clarify my
13 argument because I believe this is an important
14 issue.

15 Q. Very good. Please explain how the Company
16 constructs the weather variable for its
17 econometric model?

18 A. Con Edison uses the average dry-bulb and wet-
19 bulb daily temperature observations to construct
20 a 57.5° base weather variable cooling degree
21 days (CDD) for a month or a quarter. The
22 monthly CDD is defined as the sum of the daily
23 CDD values for the month. Weights for billing
24 cycles may be incorporated in the computation to

1 account for the time slippage between meter
2 reading and energy consumption.

3 Q. Does the Company use the daily CDD for all
4 months of a calendar year?

5 A. Yes. The Company includes the historical data
6 for CDD in all months from January through
7 December.

8 Q. How does the Company develop its forecast for
9 the CDD variable?

10 A. The Company uses its forecasted daily values for
11 the CDD variable to determine the forecast for
12 the monthly CDD variable, with or without
13 accounting for the billing cycle weights.

14 Q. Are the daily values for CDD based on the 30-
15 year average?

16 A. Only for the summer months. For the non-summer
17 months, defined by Con Edison as November
18 through April, Con Edison assumes zero for the
19 CDD variable. This assumption does not comport
20 with the 30-year average.

21 Q. Does Con Edison modify the average daily
22 observations for the CDD variable?

23 A. Yes. The average daily observations are
24 smoothed for the entire summer period defined as

1 May through October. The smoothed daily
2 forecasts gradually increase from the beginning
3 of May and reach a peak in July and August, and
4 wind down at the end of October.

5 Q. Is smoothing the average daily observations for
6 the CDD variable relevant to forecasting sales
7 in this rate case?

8 A. No, it is not. We are dealing with sales volume
9 on a year-by-year basis in the rate case. Daily
10 variation in sales is irrelevant. Smoothing the
11 average daily observations for the CDD variable
12 is unnecessary to forecast sales for the rate
13 year, not to mention the fact that important
14 data gets lost as a result of smoothing. A
15 discrepancy is created so that the CDD variable
16 in the forecast period is no longer the same as
17 defined for the historical period.

18 Q. Are there significant values of CDD in the non-
19 summer months?

20 A. Yes, there are. As shown in the Exhibit ____
21 (AP-2), Page 1, the numbers of CDD in non-summer
22 months are significantly high in some years.
23 For example, there were 89 CDD and 45 CDD in
24 April of 2002 and 1991, respectively. In these

1 two years, weather in April, a non-summer month,
2 was close to or even warmer than an average
3 October, which the Company's forecast
4 methodology considers to be a summer month. On
5 average over the 30-year history, there are 14
6 CDD in April, seven in November, and three in
7 March.

8 Q. The CDD variable may be created to capture the
9 impact of cooling appliance usage, which occurs
10 mostly during summer months. Does it justify
11 Con Edison's assumption of zero number of CDD in
12 non-summer months?

13 A. No. The issue here is that Con Edison
14 constructed the CDD variable on a pure
15 mathematical basis for the historical period,
16 but developed the CDD variable with subjective
17 adjustments for the forecasting period. The
18 Company's adjustments lower the forecast for the
19 CDD variable which lead to a statistically
20 biased sales forecast.

21 Q. How can the CDD variable be defined for the
22 historical period so that it is mathematically
23 consistent with the CDD variable for the
24 forecast period?

- 1 A. In order to define the CDD variable to capture
2 the impact of cooling appliance usage only for
3 the summer months, it should be done for both
4 the historical period and the forecast period.
5 In other words, the CDD observations for the
6 non-summer months should be removed from the
7 historical period. But Con Edison did not do
8 so.
- 9 Q. How does Con Edison's approach statistically
10 biased result understate the forecast?
- 11 A. The understated forecast results from applying
12 the estimated sales/weather relationship to the
13 forecasted sales.
- 14 Q. Has the impact of the average CDD in the non-
15 summer months, including those high values in
16 April of 1991 and 2002, been captured by the
17 sales/weather relationship in Con Edison's
18 models?
- 19 A. Yes. Because the models are estimated based on
20 the actual data, the relationships between sales
21 and the CDD variable have captured the impact of
22 the average CDD in the non-summer months. The
23 sales/weather relationships have been assigned
24 by the econometric model some of the effect of

1 the CDD variable that has higher levels in the
2 non-summer months. The estimated impact can be
3 shown by the difference in the estimated
4 coefficients of an econometric model. As shown
5 in page 2 of Exhibit ___ (AP-2), the
6 coefficients for the SC 1 and SC 9 models differ
7 considerably when the non-summer CDD are
8 assigned zero for the historical data.

9 Q. Would using such defined relationships result in
10 a biased forecast if zeros are assumed for the
11 non-summer months?

12 A. Yes. Since the forecast for the CDD variable is
13 lower than the average of the historical data,
14 the sales forecast deviates from a forecast that
15 would be produced under the assumption of normal
16 weather.

17 Q. How many CDD are there in those excluded months?

18 A. There was a total of 26 cooling degree days in
19 the months of March, April, November and
20 December for a year based on the 30-year
21 historical data for 1978-2007.

22 Q. Do you have a proposal to remedy this problem?

23 A. Yes. Daily observations for all months of 30
24 year historical data should be retained to

1 compute the average daily CDD to construct the
2 monthly CDD variable. I used an alternative
3 method by adding the monthly total CDD for each
4 of the non-summer months back to the forecast so
5 that the annual total of the forecast is equal
6 to the annual total of the 30-year average.
7 This forecast is a proxy and should be very
8 close to the forecast using the CDD forecast I
9 prescribed above.

10 Q. Please describe your concern related to the
11 Company's employment forecast?

12 A. Con Edison's employment forecast was provided by
13 Moody's Economy.com in September of 2007.
14 During the course of my review, Con Edison
15 provided an updated employment forecast that
16 Economy.com developed in April 2008. I
17 recommend that the updated employment forecast
18 be used which would result in Con Edison's sales
19 forecast reflecting not only the new benchmark
20 for 2007 but also more recent economic changes.

21 Q. Have you addressed all these issues in your
22 sales volume forecast?

23 A. Yes. In addition to developing models as I
24 discussed earlier, my sales forecast has

1 reflected my forecast for the CDD variable and
2 the updated employment forecast. The estimated
3 output for the models is provided in Exhibit ____
4 (AL-2), pages 5-10.

5 Q. How much does your forecast differ from Con
6 Edison's forecast?

7 A. In aggregate my forecast differs from the
8 Company's forecast by a margin of 43 GWhs, or
9 less than one-tenth of one percent of total
10 sales for Con Edison's customers. I consider
11 the difference to be in the range of acceptable
12 forecasting error. Therefore, I recommend that
13 the Company's sales volume forecast be accepted
14 as filed. This, however, should not in any way
15 suggest that Staff has accepted Con Edison's
16 methodology. Nor should it suggest that Staff
17 has accepted Con Edison's sales adjustment for
18 the impact of DSM savings.

19 Q. What is Con Edison's estimated impact of DSM
20 savings on its sales forecast?

21 A. Con Edison projected that, for the rate year,
22 the total DSM savings from various programs will
23 be 1,075 GWhs for its customers, not including
24 NYPA and EDDS.

1 Q. How did Con Edison construct its DSM savings
2 database?

3 A. Con Edison evaluates the DSM savings on a
4 cumulative basis. The DSM database was
5 constructed in such a way that all DSM savings
6 achieved since April 2005 are included in the
7 DSM forecast.

8 Q. How should such cumulative DSM savings be used
9 to calculate the forecasted impact of DSM
10 savings?

11 A. Since its models are estimated on the historical
12 sales data, Con Edison's sales forecast has
13 reflected the actual DSM savings up to the test
14 year 2007. As such, only the forecasted DSM
15 savings achieved after 2007 should be used to
16 adjust the rate year sales forecast. In other
17 words, relative to the cumulative DSM savings,
18 only the incremental DSM savings after 2007
19 should be used to adjust the rate year sales
20 forecast.

21 Q. How did Con Edison calculate the DSM impact to
22 adjust its sales forecast?

23 A. Con Edison subtracted the cumulative actual
24 savings from each month of calendar year 2007

1 from the cumulative savings projected for the
2 same month in the rate year ending March 2010.
3 Con Edison does this to be consistent with its
4 sales forecast methodology in which the annual
5 change in sales level is forecasted. In a
6 methodology where the level of sales is
7 forecast, the cumulative actual DSM savings from
8 the end of the base year should be subtracted
9 from the cumulative DSM savings for all months
10 of the forecast year.

11 Q. Do you agree with the Company's estimated sales
12 adjustment for the impact of DSM savings?

13 A. No. The Company's database for the cumulative
14 DSM savings contains incorrect data.
15 Consequently, the incremental DSM savings
16 calculated from this database is incorrect.

17 Q. What are the programs included for the DSM
18 savings in Con Edison's database?

19 A. Con Edison's DSM database consists of saving
20 estimates, in load (MW) and energy (GWh), for
21 programs including Con Edison's current and
22 proposed DSM programs, programs from the Phase 3
23 of the System Benefit Charge Program (SBC 3)
24 System-Wide Demand Reduction Program (SWP), and

1 programs under the Energy Efficiency Portfolio
2 Standard (EEPS). The database also contains the
3 detailed estimates for different service
4 classes.

5 Q. What errors did you find in Con Edison's
6 forecast for DSM savings?

7 A. Con Edison's estimates for the actual savings
8 achieved under SBC 3 are incorrect. SBC 3
9 started in June 2006 and cumulative DSM savings
10 has been reported since then by New York State
11 Energy Research and Development Authority
12 (NYSERDA), which administers the program. Con
13 Edison's only input the DSM savings for the
14 month of December 2007, leaving the estimates
15 for June 2006 through November of 2007 blank.

16 Q. Why are the actual DSM savings for all the
17 months of 2007 relevant to Con Edison's sales
18 forecast for the rate year?

19 A. As I discussed earlier, Con Edison's sales
20 forecast should be adjusted for incremental DSM
21 savings after 2007. Any actual cumulative DSM
22 savings through each month of 2007 must be
23 subtracted from the cumulative DSM saving
24 projection for the same month of the rate year.

- 1 Therefore, the forecast for the incremental DSM
2 savings will not be correct if the actual DSM
3 savings for 2007 are incorrectly reported.
- 4 Q. Has the Company recognized this error during
5 your review period?
- 6 A. Yes. The Company revised the DSM database and
7 provided the corresponding forecast for
8 incremental DSM savings in its response to Staff
9 IR DPS-381.7.
- 10 Q. What is the Company's revised DSM adjustment for
11 the rate year?
- 12 A. The Company reduced the estimated total DSM
13 impact by 154 GWhs.
- 14 Q. Do you agree with the Company's revised estimate
15 for DSM savings?
- 16 A. No. The Company's revised data is still
17 incorrect when compared with the estimates for
18 SBC 3 programs reported by NYSERDA.
- 19 Q. Have you provided your adjusted DSM savings
20 under the SBC 3 program?
- 21 A. Yes. They are provided in Exhibit ____ (AP-2),
22 page 3.
- 23 Q. Have you made other adjustments to DSM savings?

- 1 A. Yes. Con Edison's estimate of DSM savings
2 related to EEPS should be adjusted to reflect
3 the latest implementation schedule for the EEPS
4 proceeding. Con Edison assumes that its
5 proposals under EEPS will start around November
6 2007. This is incorrect because, according to
7 the current EEPS procedural schedule, NYSERDA
8 Codes and Standard proposals will not be issued
9 until October 2008.
- 10 Q. What is your assumption for Con Edison's DSM
11 projection under EEPS?
- 12 A. I assume that Con Edison's DSM programs under
13 the EEPS would stand as it proposed but not
14 commence until November 2008. This assumption
15 is equivalent to a one-year postponement of the
16 sales impact.
- 17 Q. What is the total GWh impact as result of your
18 adjustment?
- 19 A. The total impact is 239 GWhs in DSM savings.
20 Consequently, the sales volume forecast for the
21 rate year is adjusted higher by the same amount.
- 22 Q. Does this conclude your testimony at this time?
- 23 A. Yes, it does.