STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

RE: Case 07-M-0548 - Proceeding on Motion of the Commission Regarding an Energy Efficiency Portfolio Standard

To: Eleanor Stein, Administrative Law Judge

Administrative Law Judge Stein's Questions in her June 22, 2007 letter:

The E Cubed Company, LLC responds on behalf of the Joint Supporters which comprises diverse interests as described in Ruben Brown's PPT presentation prepared for July 20, 2007 Overview Symposium.

The Joint Supporters, for this proceeding include providers of EE, CHP/DG and Load Response services, equipment and commodities, as well as end-users who utilize such services.

The CHP/DG interests include residential (both smaller residential and multi-family residential interests), commercial, and industrial CHP capabilities generally on the smaller scale less than 300 kW, including 1 kW systems powered by reciprocating engines, microturbines, larger reciprocating powered installations, and others. Installations to 20 MW have been developed by entities involved.

Load Response or Demand Response interests conduct projects of all sizes, including curtailment, and the use of generators of different kinds.

Comments will be organized in three categories, if any comments are made: Smaller residential (single family to four family), larger yet still small CHP (generally under 300 kW), and Demand Response.

For All Parties:

1. Can you please identify any inventories in New York State of existing building stock, appliances and fixtures that might be used to identify and target efficiency opportunities?

Smaller Existing Residential Building Stock

The inventory of smaller residential building stock (1-4 families) performed as inputs to the 2005 SBC Annual evaluation provides data on the IOU service territories under the immediate jurisdiction of the PSC for the 2001-2003 period. See page 6-74 of

`www.nyserda.org/Energy_Information/SBC/sbcmay05section6.pdf`

As utilized in the Slide presented by Eric Guyer of Climate Energy at the Overview Forum on July 20, the data was supplemented by TRW data on single family and 1-3 family residential stock for Nassau and Suffolk Counties. The slide is inserted here.

Small Residences in NYS (2003)

Serv.Area	One Unit	2-4 Units	Total
CHG&E	151,790	6,904	158,694
Con Edison	378,053	298,517	676,569
NMPC	908,124	65,026	974,150
NYSEG	552,685	33,933	586,618
O&R	117,974	7,175	125,148
RG&E	217,685	13,212	230,897
LIPA -TRW	764,146	33,561	797,707
Total Bldgs	3,090,457	458,328	3,548,785

The citations are drawn from Chapter 6 of the 2005 SBC Evaluation and from the consultant's report.

1. www.nyserda.org/Energy_Information/SBC/sbcmay05section6.pdf

2. Skumatz Economic Research Associates, Inc., and Summit Blue Consulting, LLC. ENERGY STAR® Labeled Homes and Home Performance with ENERGY STAR® Phase 1 Market Characterization, Assessment, and Causality (MCAC) Evaluation Final Report, NYSERDA, p. 37, Table 17, July 2004.

3. LIPA (Nassau and Suffolk Data assembled from TRW)

As an alternative, HUD's 2001 Residential Energy Consumption Survey and EIA's 1993 Housing Characteristics provide competent and comparable baselines.

4. See attached <E-Cubed-JtSuppsAttA070725.pdf>

5. EIA, A Look at Residential Energy Consumption in 2001, April 2004, Table HC1-4a, HC2-4a, Table HC3-4a, Table HC4-4a, Table HC5-4a, Table HC6-4a, Table HC7-4a, Table CE2-4c, and Table CE3-4c; and EIA, Housing Characteristics 1993, June 1995, Table 3.29a, p. 168-173 for windows area.

The problem with relying on the NYSERDA Facts and Figures for 2005 is that it applies average data to both smaller residences and multifamily housing, significantly understating the consumption for single family and 1-4 family residences. As Eric Guyer's slide presentation indicates an average of 9,000-kWh/ yr. for single-family homes is more appropriate. This is

borne out by the 1993 northeast energy consumption data for the EIA where for homes of 2,000 sq. ft. it did average 9,700 kWh/yr.

6. ftp://ftp.eia.doe.gov/pub/consumption/residential/recs93ne.pdf.

2. Can you please identify any specific methods used in this or other jurisdictions of creating inventories of existing building stock, appliances and fixtures that might be used to identify and target efficiency opportunities?

See above. The former State Energy Office and its successors in NYSERDA have created multiple inventories that can be built upon however, single family residential data needs to be disaggregated from the blended averages with multi-family housing in order to facilitate program design to deal existing and new single family housing.

3. Can you please identify any specific energy efficiency programs targeted to existing building stock, appliances and fixtures rather than to new construction? If possible, provide a description, cost per MWh or Decatherm, and total resource cost test score for each such program.

New York has not embarked upon a Residential micro-CHP initiative such as is in place in Massachusetts under the auspices of at least one utility. This technology is cost competitive to retail rates and can reduce overall energy efficiency by 25-30%.

NYSERDA currently has numerous incentive programs that could apply to existing building stock, appliances and fixtures. See programs existing now listings from NYSERDA.

4. Can you please identify any specific energy efficiency programs targeted to participants lacking available capital to invest in energy efficiency measures? If possible, provide a description, cost per MWh or Decatherm, and total resource cost test score for each such program.

The pay as you save concept, which has been advanced by pending legislation in various States, is extremely worthwhile and should be considered for New York's EEPS purposes. See California Waste Energy recovery bill. See also residential micro-CHP advancement bill filed in Massachusetts's legislature on July xx.

5. Are you aware of any specific market transformation energy efficiency programs that are not already being pursued in New York? If possible, please provide a description, cost per MWh or Decatherm, and total resource cost test score for each such program.

Yes, while we do not agree with all particulars, for example no energy payment when called upon, the ISO-NE Forward Capacity Market settlement and FERC authorization provides a market transformation mechanism for EE, DG, and DR/LM, in that these resources are eligible to aggregate and get paid for additional benefits from the forward wholesale capacity market. Entering EE, DG/CHP, and a much broader DR capability into the NYISO Capacity Market should be explored as part of the EEPS process. The result in New England brought out several thousand megawatts of resources in Spring 2007 for several years out.

The Connecticut EE/CHP Efficiency Standard should be examined carefully. It was mandated by legislation in 2005 and revised in 2007.

6. What entities would be most appropriate and effective in delivering:

If delivering entity means the originating entity for the program as from distinct those who would respond and implement, then we are talking about enabling independent authorities (NYSERDA, LIPA, NYPA), regulated utilities (by PSC), municipal utilities and similar entities, to do everything that the body politic encourages them to do to meet the shared policy objective of managing energy efficiently.

(a) market transformation type programs

For delivery, an independent entity such as NYSERDA and other non-utility entities, NYISO, PSC. For implementation any number of entities, including municipalities.

(b) peak shaving/demand response type programs

For delivery, NYISO or local utility - (For implementation third party aggregators should be encouraged such as Demand Response providers/Responsible Interface Parties. The prototypical models developed over nine years by the NYISO and the demand response industry now mobilizing more than 1,000 MW should be employed to expand measures, rather than falling back on rigid metering requirements requiring revenue grade meters.

(c) end-user rebate type programs

For delivery, any funding source including among others, local utilities, NYSERDA, manufacturers. For implementation: ESCOs, equipment installers, engineering companies, etc.

(d) energy audit type programs

For delivery, any funding source, local utilities, NYSERDA. For implementation, engineering companies, utility personnel, independent energy auditors, ESCOs, etc.

(e) weatherization type programs

For delivery, any funding source, such as local utilities, municipalities, NYSERDA. For implementation, vendors, engineering companies, ESCOs, etc.

(f) programs for participants lacking capital

For delivery, any funding source, such as the state, NYSERDA, local utilities, municipalities, including tax breaks. For implementation, banks, financing consortia, ESCOs, etc.

(g) programs targeted to new construction

For delivery, any funding source including among others, local utilities, NYSERDA, manufacturers. For implementation: ESCOs, equipment installers, engineering companies, etc.

(h) programs targeted to existing building stock, appliances and fixtures

For delivery, any funding source including among others, local utilities, NYSERDA, manufacturers. For implementation: ESCOs, equipment installers, engineering companies, etc.

7. What entities would be least appropriate and effective in delivering:

(i) market transformation type programs – least appropriate is utility.
(j) peak shaving/demand response type programs – every body is needed here
(k) end-user rebate type programs – anybody who can do should do it.
(l) energy audit type programs - – anybody who can do should do it.
(m) weatherization type programs– anybody who can do should do it.
(n) programs for participants lacking capital– anybody who can do should do it.
(o) programs targeted to new construction– anybody who can do should do it.

(p) programs targeted to existing building stock, appliances and fixtures – anybody who can do should do it.

8. Is your entity or organization interested in being a provider of energy efficiency programs? If so, what types?
The Joint Supporters are a voluntary association of entities that provide or consume various services, equipment, fuel, etc, but the association itself is not positioned to be a provider of energy efficiency programs. Most of the providers involved start relationships with end-users provide energy audits as a starting point in helping the end-user facility gain understanding leading to energy efficiency improvements.

9. Is your entity or organization opposed to being a provider of energy efficiency programs? If so, what types?

See number 8 above.

ATTACHMENT A

JOINT SUPPORTERS BY THE E CUBED COMPANY LLC

RE: Case 07-M-0548 - Proceeding on Motion of the Commission Regarding an Energy Efficiency Portfolio Standard

Administrative Law Judge Stein's Questions in her June 22, 2007 letter:

SUPPLEMENTAL DATA PAGES PROVIDED BY THE JOINT SUPPORTERS

1. A series of five tables and figures from the September 2006 Buildings Energy Data Book of the Department of Energy which provides links to 200 databases. There are many other useful references on existing buildings and new construction.

   http://buildingsdatabook.eere.energy.gov/

2. Two sheets from the 2005 Class Demand Study prepared by Consolidated Edison Company of New York, Inc. filed in May 2007 in Case No. 07-E-0523 which indicate the loads winter and summer of the residential customers in Service Classification No. 1 – Residential indicating the average coincidental and non-coincidental peak kW across a range of annual load sizes. This kind of data is available for most of the regulated utilities within the past five years and could provide benchmarking data for energy efficiency baselines.

One valuable resource website is National Renewable Energy Laboratory (NREL) which provides links to many existing Building Data Bases

http://www.nrel.gov/analysis/analysis_tools_tech_build.html

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7.3.5 Characteristics of a Typical Single-Family Home (1)

Year Built		late 1960s		Building Equipment	Type	Fuel	Age (5)
Occupants		3		Space Heating	Central Warm-Air Furnace	Natural Gas	12
Floorspace				Water Heating	50 Gallons	Natural Gas	9
Heated Floorspace		2047		Space Cooling	Central Air Conditioner		9
Cooled Floorspace		2061					
Garage		2-Car					
Stories		1		Appliances	Type / Fuel / Number	Size	Age (5)
Foundation		Basement		Refrigerator	2-Door	19 Cubic Feet	8
Total Rooms (2)		6		Clothes Dryer	Electric		
Bedrooms		3		Clothes Washer	Top Loading		
Other Rooms		3		Range/Oven	Electric		
Full Bathroom		2		Microwave Oven			
Half Bathroom		0		Dishwasher			
Windows				Color Televisions	3		
Area	(3)	235		Ceiling Fans	3		
Number	(4)	16		Computer			
Type		Single-Pane		Printer			
Frame		Nonmetal					
Insulation: Well or Adequate							

Note(s): 1) This is a weighted-average house that has combined characteristics of the nation's stock homes. Although the population of homes with similar traits may be few, these are likely to be the most common. 2) Excludes bathrooms. 3) 11.5% of floorspace. 4) Based on a nominal 3' X 5' window. 5) Years.

Source(s): EIA, A Look at Residential Energy Consumption in 2001, April 2004, Table HC1-4a, HC2-4a, Table HC3-4a, Table HC4-4a, Table HC5-4a, Table HC6-4a, Table HC7-4a, Table CE2-4c, and Table CE3-4c; and EIA, Housing Characteristics 1993, June 1995, Table 3.29a, p. 168-173 for windows area.

1.2.6 2001 Residential Delivered Energy Consumption Intensities, by Housing Type

Type	Per Square Foot (10^3 Btu)	Per Household (10^6 Btu)	Per Household Members (10^6 Btu)	Percent of Total Consumption
Single-Family:	**44.8**	**107.3**	**39.8**	**80.1%**
- Detached	44.7	108.5	39.6	69.4%
- Attached	45.6	100.4	37.5	10.7%
Multi-Family:	**52.1**	**54.3**	**25.8**	**14.6%**
- 2 to 4 units	56.1	78.1	34.3	7.5%
- 5 or more units	48.5	41.0	20.5	7.1%
Mobile Homes	**72.0**	**75.9**	**29.4**	**5.3%**
				100%

Source(s): EIA, A Look at Residential Energy Consumption in 2001, April 2004, Table CE1-6.1u and Table CE1-6.2u.

5.6.12 Main Residential Heating Equipment as of 1987, 1993, 1997, and 2001 (percent total households)

Equipment Type	1987	1993	1997	2001
Natural Gas	**55%**	**53%**	**53%**	**55%**
Central Warm-Air Furnace	35%	36%	38%	42%
Steam or Hot-Water System	10%	9%	7%	7%
Floor/Wall/Pipeless Furnace	6%	4%	4%	3%
Room Heater/Other	4%	3%	4%	3%
Electricity	**20%**	**26%**	**29%**	**29%**
Central Warm-Air Furnace	8%	10%	11%	12%
Heat Pump	5%	8%	10%	10%
Built-In Electric Units	6%	7%	7%	6%
Other	1%	1%	2%	2%
Fuel Oil	**12%**	**11%**	**9%**	**7%**
Steam or Hot-Water System	7%	6%	5%	4%
Central Warm-Air Furnace	4%	5%	4%	3%
Other	1%	0%	0%	0%
Other	**13%**	**11%**	**9%**	**8%**
	100%	**100%**	**100%**	**100%**

Note(s): Other equipment includes wood, LPG, kerosene, other fuels, and none.

Source(s): EIA, A Look at Residential Energy Consumption in 2001, April 2004, Table HC3-2a; EIA, A Look at Residential Energy Consumption in 1997, Nov. 1999, Table HC3-2a, p. 55; EIA, Housing Characteristics 1993, June 1995, Table 3.7b, p. 63; and EIA, Housing Characteristics 1987, May 1989, Table 14, p. 33.

benefit. In Zone 5, the cooling load dominates the electrical energy loads in homes with air-conditioning.

A better predictor of electric energy consumption is the fuel source used for space heating. Heating fuel type provides an indication of the fuel source available not only for space heating, but also for water heating, cooking and clothes drying. However, the use of fuel gas for heating does not necessarily mean that fuel gas-fired appliances are used. Figure 6 shows electric consumption from the RECS data according to main type of heating fuel and EIA Division. Only the data pertaining to single-family homes is considered. For homes without electric heating equipment, the areas with more cooling degree-days (CDD) use significantly more electricity than homes in climates with fewer CDD.

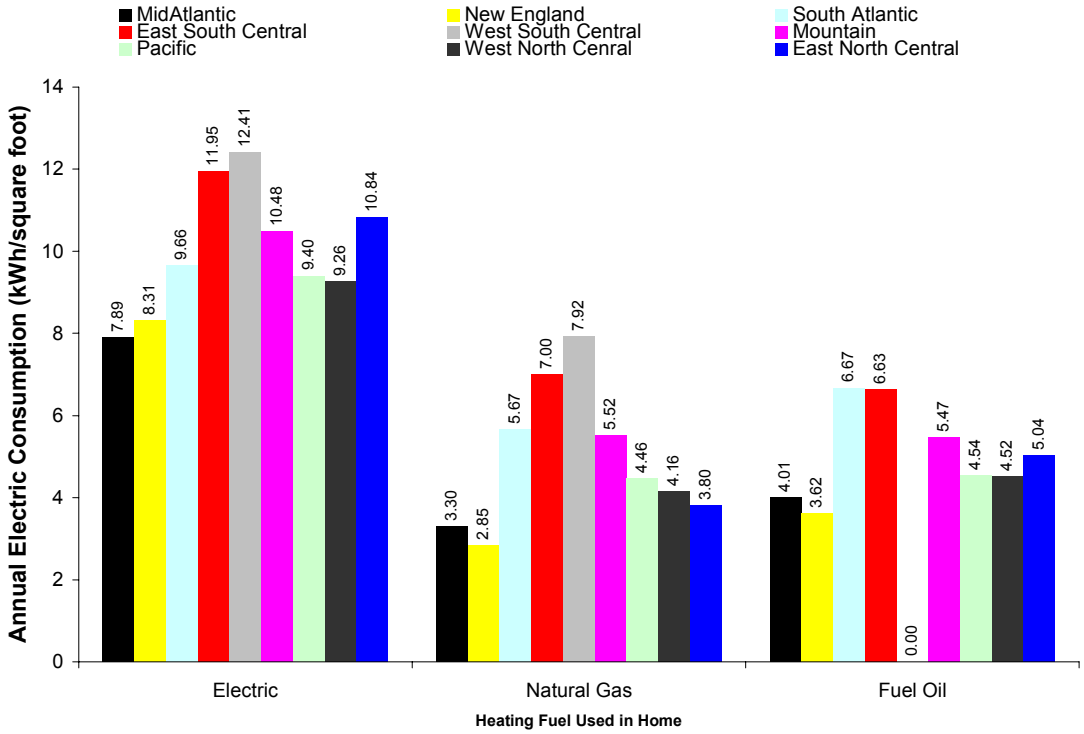

Figure 6 - Annual Electric Consumption by Heating Fuel (Single-Family Homes)

Across all years of construction, the data set does indicate the high correlation between type of heating system and annual electric consumption. For non-electric heating systems, the annual consumption ranges between 3 kWh and 8 kWh per square foot of living space. The higher estimates are presumably for areas where air-conditioning is prominent and with higher CDD. A value of "0.00" indicates that no houses heated with that fuel were identified.

The annual consumption trend for single-family detached homes that use electricity for major appliances and space conditioning is shown in Figure 7. Similarly to the previous figures, the data is normalized to square footage of heated space per home. Data are compiled in multi-year bins until 1989 and is then evaluated on an annual basis. The data for the last two available years, 1996 and 1997, are comprised of a limited data set of less than 10 records and therefore may not be representative of the entire set of homes in that year.

6.1.4 Average Annual Carbon Dioxide Emissions for Various Functions

	Annual Unit Energy Consumption		Carbon Emissions (MTCE)	Carbon Emissions (lb CO2)
Stock Refrigerator	1249	kWh - Electricity	0.2	1,800
Stock Electric Water Heater	2549	kWh - Electricity	0.4	3,600
Stock Gas Water Heater	19.8	million Btu - Natural Gas	0.3	2,300
Stock Oil Water Heater	28.3	million Btu - Fuel Oil	0.6	4,500
Single-Family Home	107.3	million Btu	3.1	25,000
Mobile Home	75.9	million Btu	2.2	17,700
Multi-Family Unit in Large Building	41.0	million Btu	1.2	9,500
Multi-Family Unit in Small Building	78.1	million Btu	2.2	18,200
School Building	2125	million Btu	71.5	578,400
Office Building	1376	million Btu	46.3	374,500
Hospital, In-Patient	60152	million Btu	2025.0	16,372,500
Stock Vehicles				
Passengar Car	550	gallons - Gasoline	1.3	10,600
Van, Pickup Truck, or SUV	647	gallons - Gasoline	1.5	12,400
Heavy Truck	1886	gallons - Diesel Fuel	4.6	37,400
Tractor Trailer Truck	11980	gallons - Diesel Fuel	29.4	237,700

Source(s): EIA, AEO 2006, Feb. 2006, Table A2, p. 134-136 for consumption and Table A18, p. 160 for emissions, and Table G1, p. 221 for gasoline heat rate; EIA, A Look at Residential Energy Consumption in 2001, May 2004, Table CE4-1c for water heater energy consumption, Table HC5-1a for refrigerators and Table CE5-1c for refrigerator energy, and Table CE1-4c for household consumption; EIA, 2003 Commercial Buildings Energy Consumption Survey, June 2006, Table C3, p. 247 for commercial buildings; ORNL, Transportation Energy Data Book: Edition 25, 2006, Table 4.1, p. 4-2, Table 4.2, p. 4-3, Table 5.1, p. 5-2 and Table 5.2, p. 5-3 for vehicles; and EIA, Assumptions to the Annual Energy Outlook 2006, Mar. 2006, Table 2, p. 9 for carbon coefficients.

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REPORT 2A SAMPLE TEST CUSTOMER DATA

CLASS-SC01 WINTER -2005

STRATIFICATION VARIABLE

LINE NO (1)	SAMPLE GROUP (2)	ANNUAL KWH RESID SUM JUN-SEP KWH RELIG LOW (3)	HIGH (4)	NO OF TEST CUSTOMERS (5)	STRAT VAR AVG PER TEST CUST (6)	AVG NON-COIN. KW PER CUST (7)	AVG COIN. KW PER CUST (8)	COIN. FACTOR PERCENTAGE (8)/(7) X 100 (9)	TEMP TAB (10)
1	RESID A		1,948	13	1,499	.882	.252	28.571429	007
2	GROUP B	1,949	2,897	22	2,419	1.424	.368	25.842697	007
3	GROUP C	2,898	3,897	44	3,372	1.540	.489	31.753247	007
4	GROUP D	3,898	5,239	28	4,489	1.558	.634	40.693196	007
5	GROUP E	5,240	7,741	39	6,368	2.797	1.164	41.616017	007
6	GROUP F	7,742	999,999,999	68	12,526	4.756	1.981	41.652649	007
7	01-RESIDEN			214					
8	RELIG A		13,999	39	4,020	4.997	1.661	33.239944	001
9	GROUP B	14,000	38,999	30	22,869	27.133	14.651	53.996978	001
10	GROUP C	39,000	89,999	34	54,720	46.497	28.187	60.621115	001
11	GROUP D	90,000	999,999,999	27	200,688	142.438	104.729	73.526025	001
12	51-RELIG			130					
13	SC01			344					

COIN. FACTOR PERCENTAGE)/(7) X 100 (9)	TEMP TAB (10)
30.179828	008
44.084881	008
48.130841	008
57.580340	008
48.006174	008
52.477204	008
40.695383	014
41.682765	014
49.131167	014
74.853381	014

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
REPORT 2A SAMPLE TEST CUSTOMER DATA
CLASS-SC01 SUMMER -2005

STRATIFICATION VARIABLE

LINE NO (1)	SAMPLE GROUP (2)	ANNUAL KWH RESID SUM JUN-SEP KWH RELIG LOW (3)	HIGH (4)	NO OF TEST CUSTOMERS (5)	STRAT VAR AVG PER TEST CUST (6)	AVG NON-COIN. KW PER CUST (7)	AVG COIN. KW PER CUST (8)	COIN. FACTOR PERCENTAGE (8)/(7) X 100 (9)	TEMP TAB (10)
1	RESID A		1,948	11	1,518	1.279	.386	30.179828	008
2	GROUP B	1,949	2,897	21	2,420	1.885	.831	44.084881	008
3	GROUP C	2,898	3,897	39	3,363	2.568	1.236	48.130841	008
4	GROUP D	3,898	5,239	29	4,463	2.645	1.523	57.580340	008
5	GROUP E	5,240	7,741	38	6,365	3.887	1.866	48.006174	008
6	GROUP F	7,742	999,999,999	62	12,556	6.580	3.453	52.477204	008
7	01-RESIDEN			200					
8	RELIG A		13,999	41	4,055	7.104	2.891	40.695383	014
9	GROUP B	14,000	38,999	30	23,102	32.613	13.594	41.682765	014
10	GROUP C	39,000	89,999	38	54,177	80.165	39.386	49.131167	014
11	GROUP D	90,000	999,999,999	28	197,724	175.455	131.334	74.853381	014
12	51-RELIG			137					
13	SC01			337					