

## New York Energy Smart<sup>SM</sup> Energy Audit Program

# Cadman Memorial Congregational Church

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prepared by

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**NYSEERDA**

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## I. EXECUTIVE SUMMARY

This report presents the results of an energy audit conducted for Cadman Memorial Congregational Church through the New York State Energy Research Development Authority (NYSERDA) Energy Smart Energy Audit Program. This audit summarizes our findings as a result of performing field surveys, discussions with facility personnel and reviewing historic energy usage. The following table summarizes our recommended energy conservation measures:

Energy Conservation Measure	Annual Savings				Installed Cost <sup>(1)</sup>	Simple Payback (years)
	kW	kWh	mmbtu	\$		
Install High Efficiency Boilers	0.0	0	234.0	\$3,672	\$21,475	5.8
Install New Boiler Controls	0.0	0	4,680.0	\$73,439	\$3,305	0.0
Install Screw-In Compact Fluorescent Lighting (CFL)	6.6	6,915	0.0	\$1,244	\$2,592	2.1
Install Thermostatic Radiator Valves	0.0	0	351.0	\$5,508	\$1,500	0.3
T8 or T8 Retrofit Fixtures	0.2	161	0.0	\$29	\$1,090	37.7
<b>Total:</b>	<b>6.9</b>	<b>7,076</b>	<b>5265.0</b>	<b>\$83,892</b>	<b>\$29,962</b>	<b>0.4</b>

(1) Installed cost includes all labor costs and potential incentives from NYSERDA's Smart Equipment Choices Program

The ten year financial analysis<sup>(2)</sup> below presents the cash flow resulting from implementing the recommended energy conservation measures:

Year	Savings	Loan Payment	Net	Cumulative
1	\$83,892	(\$3,974)	\$79,918	\$79,918
2	\$85,150	(\$3,974)	\$81,177	\$161,095
3	\$86,427	(\$3,974)	\$82,454	\$243,549
4	\$87,724	(\$3,974)	\$83,750	\$327,299
5	\$89,040	(\$3,974)	\$85,066	\$412,365
6	\$90,375	(\$3,974)	\$86,402	\$498,766
7	\$91,731	(\$3,974)	\$87,757	\$586,524
8	\$93,107	(\$3,974)	\$89,133	\$675,657
9	\$94,504	(\$3,974)	\$90,530	\$766,187
10	\$95,921	(\$3,974)	\$91,947	\$858,134
<b>Totals:</b>	<b>\$897,871</b>	<b>(\$39,736)</b>	<b>\$858,134</b>	

(2) Assumptions include principal of \$29,962, annual utility escalation rate of 1.5%, APR of 9.9% discounted 4.0% by NYSERDA Energy Smart Loan Fund to 5.9%.

The primary goal of this program is to reduce energy use in New York State. To help achieve this, we have included information about other NYSERDA programs that can provide technical services and loan subsidies to assist you to implement these measures.

## I. NYSERDA PROGRAM OPPORTUNITIES

NYSERDA sponsors a wide range of programs that are directed at improving energy efficiency, reducing environmental pollution, as well as research and development. These programs can provide additional technical services, cash incentives for implementation and loan subsidies. We have identified the following programs that may be applicable for your facility:

- Energy Smart Loan Fund
- Smart Equipment Choices
- Peak Load Reduction Program

The Energy Smart Loan Fund provides interest rate reduction on loans for energy efficient projects and renewable technologies. The Energy Smart Loan fund buys down the interest by 4.0%\* on loans from participating lenders. Loans can be used for pre-qualified measures and custom improvements and to help borrowers recoup their costs for technical assistance. Interest rate reductions are available for loans up to \$1,000,000 for eligible improvements. Additional incentives are available for buildings located in the Liberty Zone in Lower Manhattan. For more information on the Energy Smart Loan Fund, visit NYSERDA's website at <http://www.nyserda.org/loanfund/index.html> or call 866-NYSERDA.

The Smart Equipment Choices Program provides funding to offset the incremental cost of installing more energy efficient equipment that reduces energy consumption. The program goal is to accelerate the incorporation of energy efficient equipment into building design and operation. Eligible equipment includes high efficiency motors, efficient lighting, variable speed drives and efficient HVAC equipment. For more information on Smart Equipment Choices, visit NYSERDA's website at <http://www.nyserda.org/912pon.html> or call 866-NYSERDA.

Appendix A of this report has a NYSERDA applications for applicable Smart Equipment Choices Program incentives we have identified in the survey. An incentive of \$45 may be available if the qualifying measures are implemented.

NYSERDA's Peak Load Reduction Program provides funding for the identification and implementation of projects that will result in reduced peak demand in New York, particularly in New York City, for peak summer months through Permanent Demand Reduction Efforts (PDRE):

<b>Installed, Operational and Field Verified by:</b>	<b>PDRE</b>	
	<b>Con Edison Service Territory</b>	<b>Non-Con Edison Service Territory</b>
11/1/05	\$425/kW	\$225/kW

The incentive is based on the lesser of 65% of the installed costs or the incentives set forth in the above table. For more information on the Peak Load Reduction Program, visit NYSERDA's website -- <http://www.nyserda.org/903pon.html>.

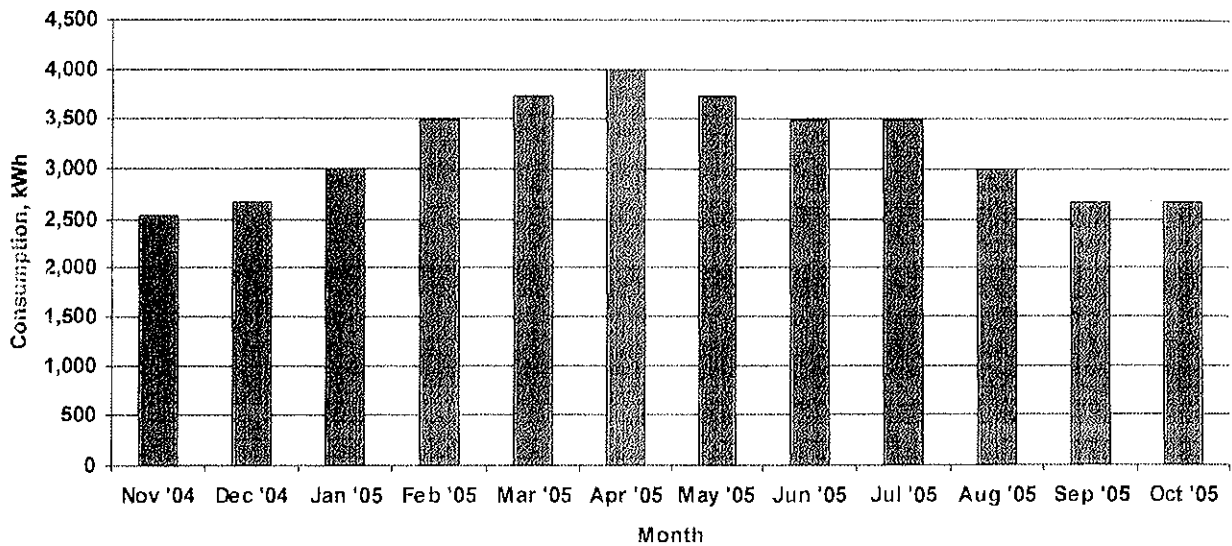
\* As of January 2005; consult NYSERDA for current rate

### III. HISTORICAL ENERGY USE & COSTS

The following table illustrates the electrical demand and consumption for the building from 11/4/2004 to 11/4/2005. Electrical use for your facility totaled 38,424 kWh, costing \$6,912 last year. Electricity is provided by Con Edison.

From	To	Days	kWh	kW	Total Cost	\$/kWh
10/6/2005	11/4/2005	29	2,668	11.3	\$480	\$0.180
9/7/2005	10/6/2005	29	2,668	11.3	\$480	\$0.180
8/8/2005	9/7/2005	30	3,002	11.3	\$540	\$0.180
7/9/2005	8/8/2005	30	3,469	13.0	\$624	\$0.180
6/8/2005	7/9/2005	31	3,469	14.0	\$624	\$0.180
5/7/2005	6/8/2005	32	3,736	14.0	\$672	\$0.180
4/8/2005	5/7/2005	29	4,002	15.0	\$720	\$0.180
3/6/2005	4/8/2005	33	3,736	16.0	\$672	\$0.180
2/8/2005	3/6/2005	26	3,469	16.0	\$624	\$0.180
1/7/2005	2/8/2005	32	3,002	18.2	\$540	\$0.180
12/7/2004	1/7/2005	31	2,668	24.8	\$480	\$0.180
11/4/2004	12/7/2004	33	2,535	22.0	\$456	\$0.180
<b>Total:</b>		<b>365</b>	<b>38,424</b>	<b>24.8</b>	<b>\$6,912</b>	<b>\$0.180</b>

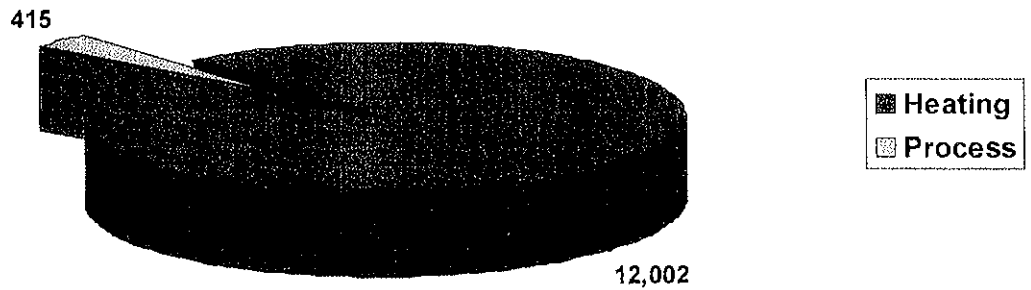
Monthly Electric Consumption



The following chart illustrates the natural gas demand and consumption for the building from 12/2/2004 to 12/2/2005. Fuel use for your facility totaled 12,417 therms. Fuel is provided by Keyspan.

From	To	Days	therms	Total Cost	S/mmbtu
12/2/2004	1/2/2005	31	2,194	\$3,054	\$13.92
1/2/2005	2/2/2005	31	3,144	\$4,192	\$13.33
2/2/2005	3/2/2005	28	1,872	\$2,594	\$13.86
3/2/2005	4/2/2005	31	2,499	\$3,262	\$13.05
4/2/2005	5/1/2005	29	801	\$1,201	\$14.99
5/1/2005	6/3/2005	33	85	\$123	\$14.47
6/3/2005	7/2/2005	29	33	\$48	\$14.55
7/2/2005	8/2/2005	31	23	\$33	\$14.35
8/2/2005	9/2/2005	31	21	\$30	\$14.29
9/2/2005	10/2/2005	30	44	\$64	\$14.55
10/2/2005	11/2/2005	31	502	\$1,387	\$27.63
11/2/2005	12/2/2005	30	1,199	\$2,317	\$19.32
<b>Total:</b>		<b>365</b>	<b>12,417</b>	<b>\$18,305</b>	<b>\$14.74</b>

**Fuel Use Distribution  
(therms)**



## IV. BUILDING DESCRIPTION

Cadman Memorial Congregational Church is located at 350 Clinton Ave. in Brooklyn, New York. The building serves as Church space, with a total floor area of 30,000 sq.ft. The walls are of masonry construction and the roof consists of a sloped roof. Glazing consists of double hung windows. The following illustrates the major equipment in the facility:

### Lighting

Area	Type of Fixture	Lamp Type	No. of Fixtures	Watts	Total Wattage
1st Floor Hallway	75W Incan	Incandescent	6	75	450
2nd Flr Hallway	60W Incan	Incandescent	5	60	300
2nd Flr Office	100W Incan	Incandescent	1	100	100
2nd Flr Office	40W Incan	Incandescent	4	40	160
2nd Flr Office	60W Incan	Incandescent	2	60	120
2nd Flr Storage	100W Incan	Incandescent	1	100	100
3rd Flr Hallway	100W Incan	Incandescent	3	100	300
3rd Flr Room 1	60W Incan	Incandescent	3	60	180
3rd Flr Room 2	60W Incan	Incandescent	3	60	180
Balcony	60W Incan	Incandescent	3	60	180
Basement Hall	100W Incan	Incandescent	5	100	500
Basement Hall	2 x 20W	Incandescent	2	40	80
Bathroom 1	28W CFL	28W Screw-In CFL	1	28	28
Boiler Room	100W Incan	Incandescent	1	100	100
Boiler Room	75W Incan	Incandescent	2	75	150
Boiler Room	F40T12	34W Fluorescent	1	50	50
Bowling Alley	100W Incan	Incandescent	11	100	1,100
Choir Room	100W Incan	Incandescent	4	100	400
Closets	100W Incan	Incandescent	2	100	200
Entrance	100W Incan	Incandescent	2	100	200
Front Entrance	60W Incan	Incandescent	2	60	120
Gym	400W MH	Metal Halide	5	455	2,275
Kitchen	2F40T12	34W Fluorescent	4	84	336
Ladies Room 1	75W Incan	Incandescent	1	75	75
Lower Auditorium	100W Incan	Incandescent	12	100	1,200
Main Chamber	100W Incan	Incandescent	11	100	1,100
Main Chamber Chandeliers	40W Incan	Incandescent	12	40	480

New York Energy Smart

Office	28W CFL	28W Screw-In CFL	1	28	28
Office Bathroom	28W CFL	28W Screw-In CFL	1	28	28
Office Chandeliers	40W Incan	Incandescent	2	40	80
Office Closet	60W Incan	Incandescent	1	60	60
Pantry	100W Incan	Incandescent	1	100	100
Parlor Chandeliers	40W Incan	Incandescent	60	40	2,400
Stain Glass (behind pulpit)	2F96T12	60W Fluorescent	2	135	270
Stain Glass (behind pulpit)	4F96T12	60W Fluorescent	2	270	540
Stain Glass (behind pulpit)	60W Incan	Incandescent	40	60	2,400
Stain Glass (behind pulpit)	F96T12	60W Fluorescent	2	75	150
Stairway 2	60W Incan	Incandescent	3	60	180
Stairway 3	60W Incan	Incandescent	1	60	60
Stairwell	28W CFL	28W Screw-In CFL	1	28	28
<b>Totals:</b>			<b>226</b>		<b>16,788 W</b>

**HVAC**

Description	Location	Manufacturer	Model Number	Qty	Capacity
Boiler	Boiler Room	NA	NA	1	1,170,000 Btuh
Boiler	Boiler Room	Weil Maclain	LGB 10	1	1,170,000 Btuh

**Service Hot Water Heater**

Description	Location	Manufacturer	Model Number	Qty	Capacity
DHW Heater 50 Gal.	Boiler Room	can Water Heater Co.	G61-50T40-3NV	1	40,000 Btuh

### Auditor's Comments

Cadman Memorial Congregational Church was gathered in 1943. This 62 year old church houses three floors a basement and a large sanctuary. The church is open all day Saturday and Sunday and for various programs on the weekdays starting at 3:00 PM and sometimes going to 10:00 PM.

Lighting in the church is comprised mostly of incandescent bulbs and a few T12 fluorescent lamps with magnetic ballasts. It is highly recommended to replace all incandescent bulbs with compact fluorescent light bulbs. This will bring a significant amount of savings. A measure is also introduced for replacing the T12 lights with T8 fluorescent lamps with electronic ballasts.

Many of the windows in the church are in very bad condition, contributing to a large portion of the building's heat loss. Some of these windows are special to the construction of the building and because it is a landmark building replacing them with highly efficient windows is not possible. A suggestion would be to repair all broken windows and caulk all windows. Adding curtains and keeping them closed can help as well.

Two old boilers were used in heating the church. Both of them broke and the church recently replaced one of the boilers. The new boiler that was installed is a standard boiler with a good efficiency. When replacing the second broken boiler with another new one, it is recommended to install a Weil-McLain LGB-10 boiler in its place. This option will provide the building with sufficient heating and its high efficiency will save energy too. Another recommendation to increase efficiency and effectiveness of the heating system would be to install Thermostatic Radiator Valves (TRVs). These would allow better regulation in the heating system by giving individual control of the radiators located throughout the building. Also recommended are boiler controls coupled with a new thermostat. The controls will allow the heating system to cycle down during the night to save energy and then begin firing to heat the building to normal operating conditions during the day. And when the new boiler is installed the controls will be able to run the boilers in tandem, when required, and operate them at optimal efficiency. Such a control would be a Sequencer 6 available through Heat-Timer Corporation.

## V. RECOMMENDED ENERGY CONSERVATION MEASURES

### Recommended ECM: Install Screw-In Compact Fluorescent Lighting (CFL)

Fluorescent lighting is inherently more efficient than incandescent lighting, screw-in CFLs provide three times more light output per watt and last up to ten times longer. Unlike incandescent lamps, fluorescent lamps cannot be operated directly from the electric lighting circuit and require a ballast to limit the current and provide the necessary voltage to start the lamp. CFL are much smaller than conventional linear fluorescent lamps and include two types that are differentiated by their base configurations. The screw-in base style is intended to replace incandescent lamps directly and includes an integral ballast. The hardwired 2 pin bayonet base style has an external ballast and requires a special fixture. This measure discusses the screwed-in CFL.

Screw-in CFLs are a simple replacement for floor and table lamps as well as other fixtures with incandescent bulbs. CFLs utilize rare-earth phosphors that provide better color rendering and increased lighting efficiency.

Following are general recommendations for switching incandescent bulbs to CFLs to provide an equivalent amount of lighting.

Incandescent (watts)	Replacement Compact Fluorescent Lamp (watts)
40	14
60	20
75	25
100	32
150	50

Following are our recommendations for screw-in CFLs at your facility:

Number	Existing Fixture	Existing Watts	New Watts	Annual Hours	kW Savings	kWh Savings	Cost Savings
54	100W Incan	100	40	1,040	3.24	3,370	\$606
4	40W Incan	40	9	1,040	0.12	129	\$23
63	60W Incan	60	15	1,040	2.84	2,948	\$530
9	75W Incan	75	25	1,040	0.45	468	\$84

Installed Cost: \$2,592  
 Source: Grainger  
 Simple Payback: 2.1 Years

**Recommended ECM: T5 or T8 Retrofit Fixtures**

Fluorescent lamps come in a variety of shapes, sizes and styles. The most common applications of fluorescent lighting are in rectangular and strip fixtures containing one to four lamps. These are installed in offices, schools, warehouses, hospitals and factories throughout the country. Up until the 1980's, the standard lamp for this type of fixture was the T12 lamp that was commonly available in 4 and 8 foot lengths. The designation "12" defines the lamp diameter at  $1\frac{1}{8}$  of an inch or 1- $\frac{1}{2}$  inches. Fluorescent lamps cannot be operated directly from the electric lighting circuit and require a ballast to limit the current and provide the necessary voltage to start the lamp. Older style ballast design relies on electromagnetic technologies that incur higher losses than new electronic designs.

Existing fixtures with T12 lamps and electromagnetic ballasts can be retrofitted with newer, efficient equipment. The T8 lamp has superseded the T12 lamp as the standard for these fixtures. The T8 lamp is  $\frac{8}{8}$  of an inch or 1 inch in diameter and provides approximately 10% more light output per watt than the T12 lamp. More recently, the T5 ( $\frac{5}{8}$  inch diameter) lamp is being installed in fixtures that previously utilized T12 or T8 lamp sizes. However, there are still many T12 fixtures in use today that, when it is time to upgrade, should be retrofitted with higher efficiency lamps and ballasts.

Please note that this measure may be eligible for NYSERDA's Smart Equipment Choices Program. The incentive only applies to retrofits and requires that the lamps and ballasts be new.

Following are our T5 and/or T8 retrofit recommendations for your facility:

Number	Existing Fixture	Existing Watts	New Fixture	New Watts	Annual Hours	kW Savings	kWh Savings	Cost Savings
1	1F40T12	50	1F32T8	30	780	0.02	16	\$3
2	1F96T12	75	1F96T8	55	780	0.04	31	\$6
2	2F96T12	135	2F96T8	110	780	0.05	39	\$7
4	2F40T12	84	2F32T8	60	780	0.10	75	\$13

Installed Cost: \$1,135  
 Source: Grainger  
 Simple Payback: 37.7 Years  
 Potential Incentive: \$45

**Recommended ECM: High Efficiency Boilers**

Boiler performance is rated based on its Annual Fuel Utilization Efficiency (AFUE). The minimum efficiency standard for hot water boilers, as established by the U.S. Department of Energy, is 80 percent AFUE. Typically, older boilers have AFUE values ranging between 70 and 75 percent and new mid-efficiency boilers can achieve as much as 85 percent. High efficiency condensing boilers can achieve seasonal efficiencies as high as 96 percent, resulting in significant gas consumption savings.

Boiler efficiency reduces with age due to wear. According to the American Society of Heating Refrigerating and Air-conditioning Engineers (ASHRAE), the median expected service life for steel water tube boilers and fire tube boilers is approximately 25 years. Older boilers require ongoing repairs including tube and tube sheet replacements and rebuilt combustion chambers to keep them operating. Older boilers are usually oversized by today's standards, leading to excessive off-cycle losses.

New boilers by today's standards are smaller physically, better insulated and can provide the same heating energy with fewer losses. Maintaining a boiler is a standard maintenance requirement but when they are past their useful life, it is more cost effective to replace, rather than repair. After the boilers are replaced, a savings in maintenance cost will be realized. This should be a factor in considering this measure along with the energy savings and payback.

High efficiency boilers not only save money but also have environmental benefits. By using less fuel, boilers emit fewer pollutants into the air.

Please note that this measure utilizes average fuel costs for your facility. The annual heating hours are based on historic Equivalent Full Load Heating Hours (EFLHH) for New York City.

Following are our boiler recommendations for your facility.

Number	Type of Boiler	Input MBH	Old Efficiency	New Efficiency	EFLHH	mmBtu Savings	Cost Savings
1	Steam	1,170,000	70.0%	80.0%	2000	234	\$3,672

Installed Cost: \$21,475  
 Source: Grainger  
 Simple Payback: 5.8 Years

**Recommended ECM: Upgrade Boiler Controls**

We recommend the installation of a computerized direct monitoring control (DMC) system to reduce unnecessary boiler operation, which can result in the overheating of the building. Direct monitoring control (DMC) systems provide control by sensing temperatures. Temperature sensors are hardwired in selected locations usually located along an interior wall far enough from the radiators so that a representative space temperature is measured. The sensors relay an average space temperature to a central microprocessor, which then runs the boiler. These sensors provide individual space temperatures, which are used to determine the average space temperature in the building. Once the space temperature is below a preset value, the boiler is instructed to produce steam or hot water until the average temperature rises in the “typical” apartments.

The energy management system can be controlled and monitored remotely that will allow for continued system optimization.

Please note that this measure utilizes average fuel costs for your facility. The annual heating hours are based on historic Equivalent Full Load Heating Hours (EFLHH) for New York City.

Following is our recommendations for your facility.

Number	Boiler Size (btu)	EFLHH	mmBtu Savings	Cost Savings
1	2,340,000	2000	4,680	\$73,439

Installed Cost: \$3,305  
 Source: Grainger  
 Simple Payback: 0.0 Year

**Recommended ECM: Install Thermostatic Radiator Valves**

Overheating can be effectively reduced through the use of thermostatic radiator valves (TRVs). In closed-loop steam systems, steam generated in the boiler is distributed to radiators and returned in the form of condensate to the boiler. Air vents allow air to enter and leave the system. By controlling the radiator air pressure, air vents indirectly regulate the radiator's temperature.

EME conducted a study for NYSERDA to evaluate the effectiveness of installing TRVs as a means of reducing overheating. EME installed TRVs in eight privately owned multifamily buildings and monitored the energy consumption for three years (1991-1994). Space heating energy was determined by monitoring and recording apartment temperature, boiler fuel consumption and domestic hot water (DHW) consumption.

The study showed that building wide installation of TRVs can save up to 15% of space heating energy. Partial installations showed average space heating savings of 9%. We recommend the installation of TRVs on all radiators.

Please note that this measure utilizes average fuel costs for your facility. The annual heating hours are based on historic Equivalent Full Load Heating Hours (EFLHH) for New York City.

Following is our recommendations for your facility.

Number of TRVs	Boiler Size (btu)	EFLHH	mmBtu Savings	Cost Savings
15	1,170,000	2000	351	\$5,508

Installed Cost: \$1,500  
 Source: Grainger  
 Simple Payback: 0.3 Year

CMCC - ONE PIPE SYSTEM

## VI. NEW YORK STATE ENERGY DEREGULATION

The New York State Public Service Commission has cleared the way for competition in New York's energy markets. The deregulation of New York's energy markets equates to consumers having the ability to choose the supplier of their electricity and natural gas. Deregulation allows consumers to gain access to new energy suppliers known as energy service companies or "ESCOs", which is intended to drive energy prices below what they would be under a regulated market.

Energy deregulation has separated energy purchase into two components: generation and transmission. Generation is what takes place where electricity is produced or natural gas is extracted from the earth. Transmission covers the delivery of the commodity to your facility including the installation and maintenance of the wires and pipes. The generation component is open for free market competition; however, the transmission component is still provided by your local utility. In switching to an ESCO, you will still be billed for transmission by your local utility but will typically receive an additional bill from the ESCO for providing the commodity.

Typically, ESCOs seek one-year contracts, although either party can terminate the contract upon notice and you can either choose another ESCO or return to your local utility. In order for an ESCO to sell energy in New York State, the Public Service Commission (PSC) requires the following:

- Description of the compliant resolution process
- 15-day notice before service discontinuation
- Consumer choice of service if service is discontinued
- Procedures for switching providers

The PSC does not resolve consumer complaints against ESCOs, although the PSC has the authority to revoke the eligibility of an ESCO if an excessive amount of complaints are received.

If you decide to purchase energy on the deregulated market through an ESCO, before you commit to any terms, you should do the following:

- Compare rates and services
- Review terms of the agreement
- Consider customer service features
- Evaluate billing and payment options
- Research the company's background

A complete listing of ESCOs that provide service in New York State is available at the PSC's website at <http://www.dps.state.ny.us/>.

## VII. METHODOLOGY

EME Group performed an evaluation of the energy consuming systems in your facility to identify energy saving opportunities. We surveyed the building and gathered operational information and physical characteristics including the following:

- a. Building Function and Occupancy Determination
  - Hours of Operation
  - Building Occupancy and Function
- b. Architectural Systems
  - Glazing Type, Window Fit, Weatherstripping and Condition.
  - Roof Construction
  - Wall Construction
  - Floor Construction
- c. Mechanical Systems
  - HVAC Equipment and Control Systems
  - Space Temperatures
  - Service Hot Water
  - Equipment Size
- d. Electrical Systems
  - Lighting (type and wattage) and Lighting Controls
  - Motors and Motor Control
- e. Survey Building for Potential Energy Conservation Measures

These results are presented in Section IV, "Building Description" of this report.

We have collected your historic utility information entered it into a spreadsheet for analysis to develop unit energy pricing, load profiles and estimate process natural gas consumption. This information is presented in both tabular and graphical format in Section III, "Historical Energy Use & Costs". We encourage you to track your energy use and compare it to this historical data to identify potential losses in energy efficiency.

Once the facility and its energy usage are understood, we evaluate the potential energy saving measures. We have developed a group of measures including lighting, motors, variable speed drives systems that we screen for energy savings using standard energy estimating methods. Projected implementation costs are then estimated based on standard methodologies including Means Construction Cost Data, manufacturer's costs, catalogs and our past experience. The recommended measures are discussed in detail in Section V, "Recommended Energy Conservation Measures" of this report.

Financial analyses are performed on these recommendations including simple economic payback and a ten-year financial project profile including interest charges and utility escalation. The results are summarized in Section I, "Executive Summary" of this report.

The primary goal of the program is to reduce energy consumption in New York State. Section II, "NYSERDA Program Opportunities" details additional programs that can assist you implement these measures.

### NOTICE

This report was prepared pursuant to the **New York Energy Smart<sup>SM</sup>** Energy Audit Program (hereafter "Audit Program") administered by the New York State Energy Research and Development Authority (hereafter the "NYSERDA"). The opinions expressed in this report do not necessarily reflect those of NYSERDA or the State of New York, and reference to any specific product, service, process, or method does not constitute an implied or expressed recommendation or endorsement of it. Further, NYSERDA and the State of New York make no warranties or representations, expressed or implied, as to the fitness for particular purpose or merchantability of any product, apparatus, or service, or the usefulness, completeness, or accuracy of any processes, methods, energy savings, or other information contained, described, disclosed, or referred to in this report. NYSERDA and the State of New York make no representation that the use of any product, apparatus, process, method, or other information will not infringe privately owned rights and will assume no responsibility for any loss, injury, or damage resulting from, or occurring in connection with, the use of information contained, described, disclosed, or referred to in this report.

## **APPENDIX A: SMART EQUIPMENT CHOICES APPLICATION**