

**CITY OF NEWARK
CITY HALL COMPLEX
City Hall Building
Police Building
Courthouse**

ENERGY ASSESSMENT

for

**NEW JERSEY
BOARD OF PUBLIC UTILITIES**

CHA PROJECT NO. 21823

February 2011

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1.0 INTRODUCTION & BACKGROUND

Three buildings within the City of Newark are included in this report; the City Hall Building, Police Building, and Courthouse.

City Hall, located at 920 Broad Street, is a five story structure built in 1908. It is currently designated as a Landmark Building and houses the municipal offices for the city. Typical hours of operation are 8:30 am to 4:30 pm.

The Police Building is six stories and was constructed around 1910. Located at 22 Franklin Avenue, it houses various police offices, including the ID Files Room, Record Room, Major Crime Unit, Homicide, Criminal Investigations Bureau, and Special Victims Unit. The building operates 24 hours per day with public access from 8:30 am to 4:30 pm.

The five story Courthouse at 31 Green Street is circa 1900. It contains various court offices and a courtroom. The building is operational hours from 8:00 am to 6:00 pm.

New Jersey's Clean Energy Program supports energy efficiency and sustainability for Municipal and Local Government Energy Audits (LGEA). Through the support of a utility trust fund, New Jersey is able to assist state and local authorities in reducing energy consumption while increasing comfort.

City of Newark City Hall



2.0 EXECUTIVE SUMMARY

This report details the results of three buildings located in Newark, New Jersey, including the City Hall, Police, and Courthouse. The City Hall is a five story structure housing municipal offices, the six story Police building contains various police offices, and the Courthouse is a five story facility containing court offices and courtroom. The following areas were evaluated for energy conservation measures:

- Air conditioner controls
- Radiator control valves
- Premium efficiency motors
- Insulation upgrade
- Duct repair
- Air conditioner replacements
- Window replacements

Various potential Energy Conservation Measures (ECMs) were identified for the above categories. Potential annual savings of \$48,430 for the recommended ECMs may be realized with a payback of 1.9 years. The adjacent powerhouse building was not included in this LGEA study, however since it provides heating steam to the buildings evaluated in this report; CHA identified additional potential measures for further evaluation. The above savings shown does not include measures associated with the powerhouse. Based on a cursory examination of boiler plant measures, CHA estimates up to an additional \$19,600 in annual energy savings could be achieved.

The ECMs identified in this report will allow for the building to reduce its energy usage and if pursued has the opportunity to qualify for the New Jersey SmartStart Buildings Program and/or Direct Install Program.

2.1 City Hall

City Hall - ECM-1 Perimeter Air Conditioner Controls

| Budgetary Cost | Annual Utility Savings | | | ROI | Potential Incentive* | Payback (without incentive) | Payback (with incentive) |
|-------------------|------------------------|--------|-------------|--------|-------------------------|--------------------------------|-----------------------------|
| | Electricity | | Natural Gas | | | | |
| \$ | kW | kWh | Therms | \$ | \$ | Years | Years |
| 45,900 | 0 | 86,200 | 0 | 15,500 | 4.1 | NA | NA |

* There is no incentive available through the New Jersey Smart Start Program for this ECM. See section 6.0 for other incentive opportunities.

City Hall - ECM-4 Air Conditioning Controls

| Budgetary Cost | Annual Utility Savings | | | ROI | Potential Incentive* | Payback (without incentive) | Payback (with incentive) |
|-------------------|------------------------|---------|-------------|--------|-------------------------|--------------------------------|-----------------------------|
| | Electricity | | Natural Gas | | | | |
| \$ | kW | kWh | Therms | \$ | \$ | Years | Years |
| 32,000 | 0 | 163,630 | 0 | 29,500 | 12.8 | NA | NA |

* There is no incentive available through the New Jersey Smart Start Program for this ECM. This measure is potentially eligible for Direct Install funding. See section 6.0 for other incentive opportunities.

2.2 Police Building

Police Building - ECM-1 Install Radiator Control Valve

| Budgetary Cost | Annual Utility Savings | | | | ROI | Potential Incentive* | Payback (without incentive) | Payback (with incentive) |
|----------------|------------------------|-----|-------------|-------|-----|----------------------|-----------------------------|--------------------------|
| | Electricity | | Natural Gas | Total | | | | |
| \$ | kW | kWh | Therms | \$ | | \$ | Years | Years |
| 130 | 0 | 0 | 30 | 30 | 1.4 | NA | 4.3 | NA |

* There is no incentive available through the New Jersey Smart Start Program for this ECM. This measure is potentially eligible for Direct Install funding. See section 6.0 for other incentive opportunities.

Note: These savings reflect a single radiator only. This can be multiplied as each radiator is retrofitted.

2.3 Courthouse Building

Courthouse - ECM-1 Premium Efficiency Motors

| Budgetary Cost | Annual Utility Savings | | | | ROI | Potential Incentive* | Payback (without incentive) | Payback (with incentive) |
|----------------|------------------------|-------|-------------|-------|-----|----------------------|-----------------------------|--------------------------|
| | Electricity | | Natural Gas | Total | | | | |
| \$ | kW | kWh | Therms | \$ | | \$ | Years | Years |
| 7,800 | 0 | 9,210 | 0 | 1,400 | 2.2 | 400 | 5.6 | 5.3 |

*This incentive is available through the 2011 New Jersey Smart Start Program for this ECM. This measure is potentially eligible for Direct Install funding. See section 6.0 for other incentive opportunities.

Courthouse - ECM-2 Insulate Domestic Hot Water Tank

| Budgetary Cost | Annual Utility Savings | | | | ROI | Potential Incentive* | Payback (without incentive) | Payback (with incentive) |
|----------------|------------------------|-----|-------------|-------|-----|----------------------|-----------------------------|--------------------------|
| | Electricity | | Natural Gas | Total | | | | |
| \$ | kW | kWh | Therms | \$ | | \$ | Years | Years |
| 5,700 | 0 | 0 | 1,130 | 1,200 | 2.2 | NA | 4.8 | NA |

*There is no incentive available through the New Jersey Smart Start Program for this ECM. See section 6.0 for other incentive opportunities.

Courthouse - ECM-3 Repair Ducts on Roof

| Budgetary Cost | Annual Utility Savings | | | | ROI | Potential Incentive* | Payback (without incentive) | Payback (with incentive) |
|----------------|------------------------|-------|-------------|-------|-----|----------------------|-----------------------------|--------------------------|
| | Electricity | | Natural Gas | Total | | | | |
| \$ | kW | kWh | Therms | \$ | | \$ | Years | Years |
| 3,100 | 0 | 2,250 | 130 | 500 | 0.6 | NA | 6.2 | NA |

*There is no incentive available through the New Jersey Smart Start Program for this ECM. See section 6.0 for other incentive opportunities.

Courthouse - ECM-4 Purchase More Efficient Heat Pump

| Budgetary Cost | Annual Utility Savings | | | ROI | Potential Incentive* | Payback (without incentive) | Payback (with incentive) |
|-------------------|------------------------|-------|----------|-----|-------------------------|--------------------------------|-----------------------------|
| | Electricity | | Fuel Oil | | | | |
| \$ | kW | kWh | Gallons | \$ | \$ | Years | Years |
| 500 | 0 | 2,060 | 0 | 300 | 8.0 | 100 | 1.7 |
| | | | | | | | 1.3 |

* Incentive shown is per the 2011 New Jersey Smart Start Program. This measure is potentially eligible for Direct Install funding. See section 6.0 for other incentive opportunities.

In addition, the following measures are recommended if they qualify for funding through the Direct Install Program (see section 6.2.4). Under this program, incentives can be potentially awarded for up to 60% of a project's budgetary cost with a maximum incentive of \$50,000, when the work is performed by a participating Direct Install contractor.

- City Hall - ECM-2 Replace Air Conditioning Units Serving Basement
- Police Building - ECM-2 Replace Air Conditioners

3.0 EXISTING CONDITIONS

3.1 City Hall

3.1.1 Building General

The City Hall building is a 156,000 square foot, five story building. Constructed in 1908, the building contains municipal offices, tax office, office of sustainability, mayor's office, and the building department. The public portion of the building opens at 8:30 am and closes at 5:00 pm Monday through Friday. There are approximately 525 occupants in the building.

The perimeter walls consist of painted plaster on the interior, with a stone layer on the exterior. The roof has a dome in the center of the main stairs. The remaining roof is flat with a rubber membrane.

The building windows are older style single pane with metal frames which are operable.

3.1.2 Utility Usage

Utilities include electricity and natural gas. Electricity and natural gas are purchased from Public Service Electric & Gas Company (PSE&G). City Hall does not pay for water. This building receives power from two separate sources; a metered service from the Broad Street side of the building and a second service feed from the 22 Franklin Street building. The feed from Franklin Street is not submetered. The building on Franklin Street has a dedicated meter located in the basement. The metered power feed enters the basement at the Broad Street side of the building in the Switchgear #2 room. The unmetered branch from Franklin Street to the City Hall enters the basement into the Switchgear #1 room through the distribution tunnel that connects the two buildings.

The single natural gas service from PSE&G is metered and serves a small café, called Carmen's Kitchen, for cooking only. The gas service also serves two small backup generators located in the basement.

From August 2009 through July 2010, the metered electric usage was approximately 588,800 kWh at a cost of about \$106,000. Analyzing electricity bills during this period showed that the building was charged at a blended unit cost of \$0.18 per kWh. Data shows that electric usage and demand varies throughout the year. A spike in both usage and demand can be seen for February 2010. This may have been due to a power outage that forced all electrical equipment to energize simultaneously upon restoration of electricity. During the same timeframe, the gas consumption for cooking was 1,787 therms at a cost of about \$1,900 or unit cost of \$1.04/therm. Utility data can be found in Appendix A.

Electricity and gas commodity supply and delivery are presently purchased from PSE&G. The delivery component will always be the responsibility of the utility that connects the facility to the power grid or gas line; however, the supply can be purchased from a third party. The electricity or natural gas supply entity will require submission of one to three years of past energy bills. Contract terms can vary among suppliers. According to the U.S. Energy Information Administration, the average commercial unit costs of electricity and natural gas in New Jersey during July 2010 was \$0.152 per kWh and \$1.09 per therm. Based on the fact that the building is currently paying above the state average for electricity, it is recommended that a third party supplier be pursued at this time. Natural gas unit cost is below the state average and, therefore, the current supplier should not be replaced.

3.1.3 HVAC Systems

Heat is primarily provided by two low pressure steam boilers located in the remote Power House, which also supplies steam to the courthouse, police station, carpentry shop, and annex. Perimeter offices have floor mounted sectional steam radiators.

Air conditioning for the perimeter offices is provided by 118 window air conditioners of approximately 9,000 -12,000 Btuh each. Each room air conditioner has a remote thermostat controlled by the occupant. The interior section of the first floor is served by four air handling units. These units are approximately 20 tons each and are located on the second floor lobby area. These air handlers are visibly old and connected to an open drive Carrier compressor located in the subbasement. The compressor is water cooled and utilizes a 90 ton cooling tower located outside on grade level. The compressor and tower are also very old but are operational. There are two condenser water pumps located in the subbasement to circulate water between the cooling tower and indoor compressor. All remaining interior areas are served by 45 air cooled split system air conditioners with air handlers in the ceilings and condensers outside on the roof or setbacks. Each indoor air handler is controlled by a local thermostat and the sizes vary from 3 to 10 tons.

3.1.4 Building Ventilation and Exhaust Systems

Building ventilation is provided by operable windows located along the perimeter walls. The interior units do not have outside air ducts. The toilet exhaust fans operate during occupied hours and are manually turned on and off when the building is opened and closed.

3.1.5 Control Systems

The split system AC units have local controls and are turned off and on with respective thermostats, which are each programmed on a 7 day schedule. Occupied setpoint is 72°F for winter and summer. The cooling tower is controlled by an aquastat. There are no controls for the perimeter radiators that utilize steam from the Power House.

3.1.6 Lighting/Electrical Systems

A lighting survey and upgrade for the entire building was recently completed. All the new fixtures utilize T-8 lamps and electronic ballasts. The majority of office space is typically occupied throughout the day and, therefore, would not benefit from installation of occupancy sensors. All interior lights are usually turned off after the cleaning crew has finished in the early evening. See Appendix C for a complete lighting inventory.

3.2 Police Building

3.2.1 Building General

The Police building is a six story structure constructed about 1910. It houses police departments such as ID Files Room, Record Room, Major Crime Unit, Homicide, Criminal Investigations Bureau, and Special Victims Unit. Occupancy is approximately 150 people. The building has public access from 8:30 am to 4:30 pm; some areas operate 24 hours per day.

The perimeter walls consist of painted plaster on the interior and stone layer on the exterior. The roof is flat with a rubber membrane. The roof is old; however, it appears to be in fair condition.

The building windows are older style single pane with metal frames which are operable.

3.2.2 Utility Usage

This building has a metered power feed which also serves a portion of City Hall. The power fed to City Hall building is not submetered. There is no gas service. Electricity is purchased from PSE&G. The building does not pay for water since it is a municipal water system.

From March 2009 through February 2010, the metered electric usage was approximately 2,739,580 kWh at a cost of about \$491,000. Analyzing electricity bills during this period showed that the building was charged at a blended unit cost of \$0.18 per kWh. Data shows that electric usage increases in the summer months due to air conditioning. Utility data can be found in Appendix A.

According to the U.S. Energy Information Administration, the average commercial unit cost of electricity in New Jersey during July 2010 was \$0.152 per kWh. The building is currently paying above the state average for electricity; therefore, a third party electricity supplier should be investigated.

3.2.3 HVAC Systems

Each perimeter office has a cast iron sectional steam radiator for heating. The steam comes from the Powerhouse and enters the building in the basement level. The steam is fed up the building via risers to all perimeter radiators. There is no interior heating. The condensate flows down the building to a condensate tank and pump, and then pumped back to the Powerhouse.

The air conditioning is provided by 15 split system air conditioners. These units serve various offices as outlined in the equipment list (Appendix C). Each air conditioner has a dedicated thermostat. There are also six window air conditioners in perimeter offices.

3.2.4 Building Ventilation and Exhaust Systems

Building ventilation is provided by operable windows located along the perimeter walls. The interior spaces served by the AC systems do not have outside air ducts. The toilet exhaust fans operate during normal business hours and are shut off at night.

3.2.5 Control Systems

The AC units have local controls and are turned off and on with respective thermostats, which are each programmed on a seven day schedule consisting of 72°F in occupied, and 80°F in unoccupied mode.

There are no control for perimeter radiators that utilize steam from the Powerhouse; therefore, overheating occurs frequently. Occupants place covers on the radiators and open the windows when it becomes uncomfortably hot.

3.2.6 Lighting/Electrical Systems

Recently, the building underwent a complete lighting upgrade. All existing T-12 lamps and magnetic ballasts were replaced with new fixtures that utilize T-8 lamps and electronic ballasts. The majority of office spaces is occupied throughout the day and, therefore, would not benefit from installation of occupancy sensors. All interior lights are usually turned off after the cleaning crew has finished in the early evening. See Appendix C for a complete lighting inventory.

3.2.7 Plumbing Systems

Most of the restrooms utilize older style water fixtures; however, since the building does not pay for water, replacing these with low flow fixtures would not result in economic savings. However, replacing the fixtures will result in a decreased water consumption for the building.

3.3 Courthouse

3.3.1 Building General

The Courthouse is a five story building containing various court offices and courtroom. There are approximately 190 people occupying the building during normal business hours of 8:00 am to 6:00 pm.

The perimeter walls consist of painted plaster on the interior, with a stone layer on the exterior. The main roof is flat with a rubber membrane. The roof is old, and has several leaks which were being repaired at the time of this report.

The building windows are older style single pane with metal frames which are operable.

3.3.2 Utility Usage

The building purchases electricity and natural gas. Electricity and gas are purchased from PSE&G. The natural gas serves a small generator only. The Courthouse does not pay for water since it is a municipal water system.

From March 2009 through February 2010, the metered electric usage was approximately 2,979,510 kWh at a cost of about \$441,200. Analyzing electricity bills during this period showed that the building was charged at a blended unit cost of \$0.148 per kWh. Data shows that electric usage and demand varies throughout the year. During the same timeframe, the gas consumption was 1,620 therms at a cost of about \$1,630 and unit cost of \$1.00/therm. Utility data can be found in Appendix A.

According to the U.S. Energy Information Administration, the average commercial unit cost of electricity and natural gas in New Jersey during July 2010 was \$0.152 per kWh and \$1.09 per therm. The building's electric cost is currently above the state average; therefore, it is recommended that a third party supplier be pursued. Natural gas unit cost is below the state average and the current supplier should remain.

3.3.3 HVAC Systems

The building obtains steam from the Powerhouse, which is utilized to heat a water loop. The water loop provides heating and cooling for heat pumps; approximately 236 pumps are located in the perimeter offices. In addition, 12 large heat pumps located on the roof provide heating and cooling to the interior areas of the building. The roof top heat pumps are approximately 20 tons each and have supply and return ducts on the roof ; the ducts extend down on the outside of the building to the floors. The ductwork on

the roof has holes in some areas which allows air to escape, and the heated or cooled air leaks outdoors. During the winter, the temperature of the loop is around 65°F; in summer, the loop is maintained at 85°F with a cooling tower. The cooling tower, which has three standard efficiency motors, is in average condition. One of the motors was not operational at the time of the site visit. Water is circulated by two each 40 HP and 20 HP pumps located in the roof's mechanical room. The pumps, which are in average condition, operate in lead/lag manner to balance usage.

3.3.4 Building Ventilation and Exhaust Systems

The perimeter operable windows provide ventilation. Interior AC units do not have dedicated outside air ducts, and toilet exhaust fans operate during business hours and are operated manually.

3.3.5 Control Systems

The perimeter heat pumps have local controls and are operated with dedicated thermostats, which are programmed on a seven day schedule. Setpoints are 70°F occupied, 75°F unoccupied in cooling mode; and 68°F in occupied and 80°F in unoccupied in heating.

The pumps and cooling tower are controlled manually by facility staff.

3.3.6 Lighting/Electrical Systems

A complete upgrade of lighting fixtures was recently performed, which replaced existing T-12 fixtures with T-8 lamps and electronic ballasts. Interior lights are usually turned off after the cleaning crew finishes in the early evening. Most offices are typically occupied throughout the day; therefore, installation of occupancy sensors was not a viable option. See Appendix C for a complete inventory of the lighting.

3.3.7 Plumbing Systems

The restrooms have older style, standard flow fixtures. Water savings which could result from installation of low flow fixtures is not an economically feasible measure because the City does not pay for water. However, replacing the fixtures will result in a decreased water consumption for the building. Hot water is produced by a large tank, approximately 12 foot long and 3 foot diameter, with a steam coil, which produces the hot water as required. The tank is not insulated.

4.0 ENERGY CONSERVATION MEASURES

4.1 City Hall

4.1.1 City Hall- ECM-1 Perimeter Air Conditioner Controls

There are approximately 118 window AC units in the building, each with a dedicated temperature controller. Many operate when the offices are closed and unoccupied. These units are replaced frequently since they are running for most of the year. It is intended to install a separate controller to automatically shut these units off when the offices are empty. The proposed controllers utilize an integral motion sensor which operates the units based on occupancy. Energy savings and maintenance savings will result from the reduced run times.

To calculate the savings, the energy required to currently operate the equipment was compared to operating the units for the reduced 60 hours per week with the controllers. By installing controllers on each of the 118 window AC units, it was estimated that the annual electric consumption can be reduced by approximately 86,200 kWh. In addition, by operating the ACs less, compressor failures and maintenance will be reduced.

The controls have an expected life of 15 years, according to the manufacturer, and total energy savings over the life of the project are estimated at 1,293,000 kWh, totaling \$232,500.

The implementation cost and savings related to this ECM are presented in Appendix B and summarized below:

City Hall - ECM-1 Perimeter Air Conditioner Controls

| Budgetary Cost | Annual Utility Savings | | | | ROI | Potential Incentive* | Payback (without incentive) | Payback (with incentive) |
|-------------------|------------------------|--------|-------------|--------|-----|-------------------------|--------------------------------|-----------------------------|
| | Electricity | | Natural Gas | Total | | | | |
| \$ | kW | kWh | Therms | \$ | | \$ | Years | Years |
| 45,900 | 0 | 86,200 | 0 | 15,500 | 4.1 | NA | 3.0 | NA |

* There is no incentive available through the New Jersey Smart Start Program for this ECM. See section 6.0 for other incentive opportunities.

This measure is recommended.

4.1.2 City Hall - ECM-2 Replace Air Conditioning Units Serving Basement

There are four air handling units about 20 years' old located on the first floor which serve the basement offices. These units are about 20 tons each. All four units are connected to a water cooled compressor located in the basement. This open drive compressor uses condenser water from a small 100 ton cooling tower located outside on grade. There are two small 5 HP pumps which circulate the condenser water. This measure evaluated replacing the entire water cooled system with four new air cooled air conditioning units. Each of the new indoor evaporator units would be connected to the existing ductwork, where their new corresponding 20 ton high efficiency air cooled condensing units would be located outside on grade.

To calculate the savings, the energy required to operate equipment at the proposed efficiency of 1.2 kW/ton was compared to the energy required to operate the existing equipment; which has an estimated efficiency of 1.6 kW/ton. Additional savings will be provided from elimination of the two 5 HP circulation pumps, which serve the cooling tower's condenser water loop.

The new air cooled air conditioners have an expected life of 20 years, according to ASHRAE, and total energy savings over the life of the project are estimated at 242,200 kWh, totaling \$44,000.

The implementation cost and savings related to this ECM are presented in Appendix B and summarized below:

City Hall - ECM-2 Replace Air Conditioning Units Serving Basement

| Budgetary Cost | Annual Utility Savings | | | ROI | Potential Incentive* | Payback (without incentive) | Payback (with incentive) | |
|-------------------|------------------------|--------|-------------|-------|-------------------------|--------------------------------|-----------------------------|-------|
| | Electricity | | Natural Gas | | | | | Total |
| \$ | kW | kWh | Therms | \$ | | \$ | Years | Years |
| 317,600 | 0 | 12,110 | 0 | 2,200 | (0.9) | 1,600 | >25 | NA |

* Incentive shown is per the New Jersey Smart Start Program, Electric Unitary HVAC Application. This measure is potentially eligible for Direct Install funding. See section 6.0 for other incentive opportunities.

This measure is not recommended.

4.1.3 City Hall - ECM-3 Replace Windows

The windows are very old and have single pane glass. Due to age, construction type, and condition, the windows incur excess air infiltration and offer little thermal resistance to heat transfer. By replacing the windows, heating and cooling energy savings will result in addition to increased occupant comfort.

Per the building energy audit and engineering knowledge, it was estimated that the existing windows have a U-value of 1.10 and an infiltration rate of about 1.0 CFM/LF. To calculate the savings for this measure, the baseline energy loss was found by applying these values to the total square footage and perimeter length of the existing windows in conjunction with weather bin data. The proposed energy loss was then determined using the expected U-value of 0.50 and infiltration rate of 0.2 CFM/LF, with new double pane windows installed. The difference in heating and cooling losses through the windows resulted in an annual savings of about 21,640 therms and 7,910 kWh.

It is important to note that additional architectural consideration for window replacement will need to be taken into account in order to maintain the historical integrity of the building.

New double pane windows have an expected life of 25 years, according the manufacturer, and total energy savings over the life of the project are estimated at 197,750 kWh and 541,000 therms, totaling \$612,500.

The implementation cost and savings related to this ECM are presented in Appendix B and summarized as follows:

City Hall - ECM-3 Replace Windows

| Budgetary Cost | Annual Utility Savings | | | | ROI | Potential Incentive* | Payback (without incentive) | Payback (with incentive) |
|-------------------|------------------------|-------|-------------|--------|-------|-------------------------|--------------------------------|-----------------------------|
| | Electricity | | Natural Gas | Total | | | | |
| \$ | kW | kWh | Therms | \$ | | \$ | Years | Years |
| 2,275,300 | 0 | 7,910 | 21,640 | 24,500 | (0.7) | NA | >25 | NA |

*There is no incentive available through the New Jersey Smart Start Program for this ECM. See section 6.0 for other incentive opportunities.

This measure is not recommended.

4.1.4 City Hall - ECM-4 Air Conditioning Controls

There are 45 air cooled split system air conditioners, each with a dedicated controller. The units consist of indoor evaporators and outdoor condensers located on the roof or grade. Many units are left on when the offices are unoccupied. It is intended to install a new programmable thermostat for each unit that will allow the unit to be shut off during unoccupied times. The thermostat will be equipped with an occupancy sensor in the space and a programmable interface located inside the AC unit to prohibit tampering. Energy savings and maintenance savings will result from the reduced equipment run times.

To estimate the savings, the energy currently required to operate the air conditioning equipment for 168 hours per week was compared to the energy required to operate the equipment for the proposed 60 hours per week. The difference between the two values results in a reduction of approximately 163,630 kWh annually. Additionally, with shorter operation, compressor failures and maintenance will also be reduced.

The controls have an expected life of 15 years, according to the manufacturer, and total energy savings over the life of the project are estimated at 2,454,450 kWh, totaling \$442,500.

The implementation cost and savings related to this ECM are presented in Appendix B and summarized below:

City Hall - ECM-4 Air Conditioning Controls

| Budgetary Cost | Annual Utility Savings | | | | ROI | Potential Incentive* | Payback (without incentive) | Payback (with incentive) |
|-------------------|------------------------|---------|-------------|--------|------|-------------------------|--------------------------------|-----------------------------|
| | Electricity | | Natural Gas | Total | | | | |
| \$ | kW | kWh | Therms | \$ | | \$ | Years | Years |
| 32,000 | 0 | 163,630 | 0 | 29,500 | 12.8 | NA | 1.1 | NA |

* There is no incentive available through the New Jersey Smart Start Program for this ECM. This measure is potentially eligible for Direct Install funding. See section 6.0 for other incentive opportunities.

This measure is recommended.

4.2 Police Building

4.2.1 Police Building- ECM-1 Install Radiator Control Valve

Heating is provided by steam from the Powerhouse to cast iron radiators. There is usually one radiator in each perimeter office. The radiators are not controlled, and many offices are overheated compelling

occupants to open windows or place objects over the radiators. Installing a control valve on each radiator to enable occupants to regulate the heat was assessed.

To estimate the savings, a single office with one window was used as the basis for calculations. This will allow the City to understand the associated savings and install the valves on a case-by-case basis. Not all of the offices were overheated; therefore, a calculation was performed on one sample office. The peak heating load without the use of a control valve was calculated as a baseline. Bin temperatures were then applied to the room heating load at different outdoor air temperatures to simulate the use of the control valves. With a control valve, the steam required by the radiator was reduced by approximately 61%.per.

The control valves have an expected life of 10 years, according to the manufacturer, and total energy savings over the life of the project, per typical office, are estimated at 300 therms totaling \$300.

It should be noted that savings for this measure are less than \$100, which generally are not recommended as part of a study. However, the following represents the data on installation of only one control valve. The comprehensive cost and savings of this measure will be multiplied by the number of valves the City determines to install. The payback period will remain constant.

The implementation cost and savings related to this ECM are presented in Appendix B and summarized below:

Police Building - ECM-1 Install Radiator Control Valve

| Budgetary Cost | Annual Utility Savings | | | ROI | Potential Incentive* | Payback (without incentive) | Payback (with incentive) |
|-------------------|------------------------|-----|-------------|-----|-------------------------|--------------------------------|-----------------------------|
| | Electricity | | Natural Gas | | | | |
| \$ | kW | kWh | Therms | \$ | \$ | Years | Years |
| 130 | 0 | 0 | 30 | 30 | 1.4 | NA | 4.3 |

* There is no incentive available through the New Jersey Smart Start Program for this ECM. This measure is potentially eligible for Direct Install funding. See section 6.0 for other incentive opportunities.

This measure is recommended.

4.2.2 Police Building - ECM-2 Replace Air Conditioners

The building is cooled with numerous split system air conditioners ranging in size from 5 to 20 tons. There are five air conditioners which are beyond their useful life and should be replaced. The locations served by these units are the Records Room, front vestibule, fourth floor Major Crimes Unit and Homicide, and third floor Criminal Investigations. Replacing these units, totaling 35 tons, with newer, high efficiency split system air conditioners was assessed. Each will be replaced with the same sized unit and have a seven day programmable thermostat.

To calculate the savings, an estimated existing energy efficiency ratio (EER) of 8 was used for the existing units. The summertime bin temperatures were then applied to determine energy usage for the existing units. The energy usage was compared to a newer unit with a 14 EER rating with the same run hours. The result yielded over 40% savings in electrical energy annually over the existing units.

Air conditioners have an expected life of 12 years, according to the manufacturer, and total energy savings over the life of the project are estimated at 91,320 kWh totaling \$16,800.

The implementation cost and savings related to this ECM are presented in Appendix B and summarized below:

Police Building - ECM-2 Replace Air Conditioners

| Budgetary Cost | Annual Utility Savings | | | ROI | Potential Incentive* | Payback (without incentive) | Payback (with incentive) |
|----------------|------------------------|-------|-------------|-------|----------------------|-----------------------------|--------------------------|
| | Electricity | | Natural Gas | | | | |
| \$ | kW | kWh | Therms | \$ | \$ | Years | Years |
| 120,000 | 0 | 7,610 | 0 | 1,400 | (0.9) | 2,800 | >25 |

* This incentive is available through the 2011 New Jersey Smart Start Program for this ECM. This measure is potentially eligible for Direct Install funding. See section 6.0 for other incentive opportunities.

This measure is not recommended.

4.3 Courthouse Building

4.3.1 Courthouse - ECM-1 Premium Efficiency Motors

Several motors in this building are old and inefficient and can be upgraded to higher efficiency motors. These include three 10 HP cooling tower motors, one 40 HP condenser water pump, and one 20 HP heating pump.

This measure considers energy savings due to the differences in efficiency ratings resulting from replacement of the older motors. The existing motors have an efficiency of approximately 87%; the new motors will have an efficiency of about 93%. The run times of the motors and the difference in efficiencies were calculated.

Premium efficiency motors have an expected life of 18 years, according to ASHRAE, and total energy savings over the life of the project are estimated at 165,780 kWh, totaling \$25,200.

The implementation cost and savings related to this ECM are presented in Appendix B and summarized below:

Courthouse - ECM-1 Premium Efficiency Motors

| Budgetary Cost | Annual Utility Savings | | | ROI | Potential Incentive* | Payback (without incentive) | Payback (with incentive) |
|----------------|------------------------|-------|-------------|-------|----------------------|-----------------------------|--------------------------|
| | Electricity | | Natural Gas | | | | |
| \$ | kW | kWh | Therms | \$ | \$ | Years | Years |
| 7,800 | 0 | 9,210 | 0 | 1,400 | 2.2 | 400 | 5.6 |

*This incentive is available through the 2011 New Jersey Smart Start Program for this ECM. This measure is potentially eligible for Direct Install funding. See section 6.0 for other incentive opportunities.

This measure is recommended.

4.3.2 Courthouse - ECM-2 Insulate Domestic Hot Water Tank

Domestic hot water is produced and stored in a steel tank approximately 3 feet in diameter and 12 feet long. The tank is usually maintained at around 120° F. The tank is uninsulated and loses heat to the surrounding space. Insulating the tank will decrease steam usage required to heat the water.

Energy savings were calculated by comparing the heat loss from an uninsulated tank and fully insulated tank. The insulation savings resulted in 90% less steam usage to heat the water.

The insulation has an expected life of 15 years, according the manufacturer, and total energy savings over the life of the project are estimated at 16,950 therms, totaling \$3,000.

The implementation cost and savings related to this ECM are presented in Appendix B and summarized below:

Courthouse - ECM-2 Insulate Domestic Hot Water Tank

| Budgetary Cost | Annual Utility Savings | | | | ROI | Potential Incentive* | Payback (without incentive) | Payback (with incentive) |
|-------------------|------------------------|-----|-------------|-------|-----|-------------------------|--------------------------------|-----------------------------|
| | Electricity | | Natural Gas | Total | | | | |
| \$ | kW | kWh | Therms | \$ | | \$ | Years | Years |
| 5,700 | 0 | 0 | 1,130 | 1,200 | 2.2 | NA | 4.8 | NA |

*There is no incentive available through the New Jersey Smart Start Program for this ECM. See section 6.0 for other incentive opportunities.

This measure is recommended.

4.3.3 Courthouse - ECM-3 Repair Ducts on Roof

The 12 heat pump units on the roof have extensive supply and return ductwork on the roof. These ducts have internal insulation lining, but are completely exposed to the elements on the outside. Many of the ducts are rusted and leaking air. Repairing the leaking ducts with sheet metal and outdoor mastic will prevent air from escaping.

The energy saved by repairing the ducts was calculated by taking the approximate area of the duct openings and incorporating the cost to produce the conditioned air. The estimated amount of air leakage was 500 cfm based on engineering experience. Using this airflow and a 55°F supply air temperature in the summer and 80°F in winter, it was determined that approximately 2,250 kWh and 130 therms could be saved annually.

Sheetmetal and mastic have an expected life of 10 years, according to the manufacturer, and total energy savings over the life of the project are estimated at 22,500 kWh and 1,300 therms, totaling \$5,000.

The implementation cost and savings related to this ECM are presented in Appendix B and summarized as follows:

Courthouse - ECM-3 Repair Ducts on Roof

| Budgetary Cost | Annual Utility Savings | | | | ROI | Potential Incentive* | Payback (without incentive) | Payback (with incentive) |
|-------------------|------------------------|-------|-------------|-------|-----|-------------------------|--------------------------------|-----------------------------|
| | Electricity | | Natural Gas | Total | | | | |
| \$ | kW | kWh | Therms | \$ | | \$ | Years | Years |
| 3,100 | 0 | 2,250 | 130 | 500 | 0.6 | NA | 6.2 | NA |

*There is no incentive available through the New Jersey Smart Start Program for this ECM. See section 6.0 for other incentive opportunities.

This measure is recommended.

4.3.4 Courthouse - ECM-4 Purchase More Efficient Heat Pumps

The facility directly purchases heat pumps to replace older, broken units. This measure evaluated the purchase of higher efficiency rather than standard efficiency motors. The calculations were based upon one heat pump only. As the City is required to replace heat pumps, each higher efficiency unit purchased will provide the savings noted below.

The energy savings for this measure was calculated by taking the change in efficiency from 8 EER to 14 EER and applying the annual run time for a typical 12,000 Btuh unit. The difference resulted in an annual savings of 2,060 kWh per year for replacement of one heat pump. The budgetary cost listed below is the incremental cost per ton between a standard efficiency heat pump and higher efficiency heat pump. Supporting calculations, including assumptions for the annual energy usage is provided in Appendix B.

Heat pumps have an expected life of 15 years, according to ASHRAE, and total energy savings over the life of the project are estimated at 30,900 kWh, totaling \$4,500.

The implementation cost and savings related to this ECM are presented in Appendix B and summarized below:

Courthouse - ECM-4 Purchase More Efficient Heat Pump

| Budgetary Cost | Annual Utility Savings | | | | ROI | Potential Incentive* | Payback (without incentive) | Payback (with incentive) |
|-------------------|------------------------|-------|----------|-------|-----|-------------------------|--------------------------------|-----------------------------|
| | Electricity | | Fuel Oil | Total | | | | |
| \$ | kW | kWh | Gallons | \$ | | \$ | Years | Years |
| 500 | 0 | 2,060 | 0 | 300 | 8.0 | 100 | 1.7 | 1.3 |

* Incentive shown is per the 2011 New Jersey Smart Start Program. This measure is potentially eligible for Direct Install funding. See section 6.0 for other incentive opportunities.

This measure is recommended.

5.0 POWERHOUSE

The Powerhouse building, on the eastern side of the City Hall complex has two low pressure steam Kewanee boilers installed. One boiler is 400 HP, the other 250 HP. The boilers use natural gas and have the capacity to fire #2 oil; however, there is no oil tank on the premises. The boilers are old but in good working condition. Although not part of the energy study, the Powerhouse was cursorily examined and following are potential energy saving measures.

It is important to note that the powerhouse building was not included in this LGEA study, however since it provides heating steam to the buildings evaluated in this report; CHA identified additional potential measures for further evaluation. Based on a cursory examination of boiler plant measures, CHA estimates up to an additional \$19,600 in annual energy savings could be achieved.

5.1 Boiler Economizer

The boilers are natural draft with flue gas temperatures around 550°F. The flue gases leave the boiler plant and can be recaptured and utilized. Installing a two stage Cleaver Brooks economizer on the 400 HP boiler could preheat domestic hot water or boiler feedwater.

Potential annual savings: \$12,000

Payback: 10-15yrs

5.2 Boiler Blowdown Recovery

The boilers are regularly blown down to remove particulates and minimize the dirt and scale buildup. This water is very hot when it comes from the boiler and is discharged to a drain; installing a blowdown heat recovery unit would capture the hot water to preheat the boiler feedwater. One blowdown heat recovery unit could be installed and utilized by both boilers. There is room in the boiler room to accommodate this device.

Potential annual savings: \$4,800

Payback: <5 yrs

5.3 Combustion Air Fan Controls

The combustion air fan is at full speed when the boiler is operating. The amount of air provided to the boiler is controlled by vanes which adjust the combustion air according to the boiler load. However, during part load conditions, the fan is running at full speed, but only a portion of the air is provided to the boiler. Installing a variable speed drive to enable the combustion air fan to slow down during part load conditions will save electrical energy since the fan is not running at full speed.

Potential annual savings: \$2,800

Payback: 5-10yrs

6.0 PROJECT INCENTIVES

6.1 Incentives Overview

6.1.1 New Jersey Pay For Performance Program

The P4P program is designed for qualified energy conservation projects in facilities whose demand in any of the preceding 12 months exceeds 200 kW. However, the 200 kW/month average minimum has been waived for buildings owned by local governments or municipalities and non-profit organizations. Facilities that meet this criterion must also achieve a minimum performance target of 15% energy reduction by using the EPA Portfolio Manager benchmarking tool before and after implementation of the measure(s). If the participant is a municipal electric company customer, and a customer of a regulated gas New Jersey Utility, only gas measures will be eligible under the Program. American Recovery and Reinvestment Act (ARRA) funding, when available, may allow oil, propane and municipal electric customers to be eligible for the P4P Program. Available incentives are as follows:

Incentive #1: Energy Reduction Plan – This incentive is designed to offset the cost of services associated with the development of the Energy Reduction Plan (ERP). The standard incentive pays \$0.10 per square foot, up to a maximum of \$50,000, not to exceed 50% of facility annual energy cost, paid after approval of application. For building audits funded by the New Jersey Board of Public Utilities, which receive an initial 75% incentive toward performance of the energy audit, facilities are only eligible for an additional \$0.05 per square foot, up to a maximum of \$25,000, rather than the standard incentive noted above.

Incentive #2: Installation of Recommended Measures – This incentive is based on projected energy saving and designed to pay approximately 60% of the total performance-based incentive. Base incentives deliver \$0.11/kWh and \$1.10/therm not to exceed 30% of total project cost. For each percent savings over the 15% minimum the incentive increases by \$0.005/kWh and \$0.05/therm, not to exceed a total of \$0.13/kWh and \$1.45/therm.

Incentive #3: Post-Construction Benchmarking Report – This incentive is paid after acceptance of a report proving energy savings over one year utilizing the Environmental Protection Agency (EPA) Portfolio Manager benchmarking tool. Incentive #3 base incentives deliver \$0.07/kWh and \$0.70/therm not to exceed 20% of total project cost. For each percent savings over the 15% minimum the incentive increases by \$0.005/kWh and \$0.05/therm, not to exceed a total of \$0.09/kWh and \$1.05/therm.

Part of the application for the P4P program requires that a facility benchmark their building using Energy Star Portfolio Manager Software. The City Hall, Police, and Courthouse do not have a completely metered and dedicated electrical service; therefore, this program may not be eligible.

6.1.2 New Jersey Smart Start Program

For this program, specific incentives for energy conservation measures are calculated on an individual basis utilizing the 2011 New Jersey Smart Start incentive program. This program provides incentives dependent upon mechanical and electrical equipment. If applicable, incentives from this program are reflected in the ECM summaries and attached appendices.

If the building qualifies and enters into the New Jersey Pay for Performance Program, all energy savings will be included in the total building energy reduction, and savings will be applied towards the Pay for Performance incentive. A project is not applicable for both New Jersey incentive programs.

6.1.3 Energy Efficient and Conservation Block Grant

Below is a brief summary of the Energy Efficient and Conservation Block Grant (EECBG) program. The Energy Efficiency and Conservation Block Grant Complete Program Application Package should be consulted for rules and regulations (www.NJCleanEnergy.com).

The State of New Jersey has received \$75.4 million under the EECBG program. Approximately \$61 million of these funds goes directly to 75 eligible units of local government and is distributed using a population and energy-consumption based formula. The eligible units of local government include cities and municipalities with a population of at least 35,000, and counties with a net population of at least 200,000 after reducing population totals by the population of all cities and municipalities receiving direct funding under the program.

The state has been allocated \$14.4 million where the EECBG Program requires that not less than 60% of state funds be shared with local governments that do not meet the previous population requirements. Eligible local governments include 501 municipalities and 11 counties, and can offset the cost of energy reduction implementation to a maximum of \$20,000 per building. Additionally, these rebates will be used to supplement existing Clean Energy Program incentives such as Direct Install, Smart Start, Pay for Performance, and the Local Government Energy Audit Program.

The remaining 29% of the EECBG Program funds, or approximately \$4.2 million, have been allocated for work at state government buildings and facilities. These funds are managed by the Treasury Department's Office of Energy Savings.

6.1.4 ARRA Initiative "Energy Efficiency Programs through the Clean Energy Program"

The American Recovery and Reinvestment Act (ARRA) Initiative is available to New Jersey oil, propane, cooperative and municipal electric customers who do not pay the Societal Benefits Charge. This charge can be seen on any electric bill as the line item "SBC Charge." Applicants can participate in this program in conjunction with other New Jersey Clean Energy Program initiatives including Pay for Performance, Local Government Energy Audits, and Direct Install programs.

Funding for this program is dispersed on a first come, first serve basis until all funds are exhausted. The program does not limit the municipality to a minimum or maximum incentive, and the availability of funding cannot be determined prior to application. If the municipality meets all qualifications, the application must be submitted to TRC Energy Solutions for review. TRC will then determine the amount of the incentive based on projected energy savings of the project. It is important to note that all applications for this incentive must be submitted before implementation of energy conservation measures.

Additional information is available on New Jersey's Clean Energy Program website.

6.1.5 Direct Install Program

The Direct Install Program targets small and medium sized facilities where the peak electrical demand does not exceed 200 kW in any of the previous 12 months. Buildings must be located in New Jersey and served by one of the state's public, regulated electric or natural gas utility companies. On a case-by-case basis, the program manager may accept a project for a customer that is within 10% of the 200 kW peak demand threshold.

The 200 kW peak demand threshold has been waived for local government entities that receive and utilize their [Energy Efficiency and Conservation Block Grant](#) as discussed in section 5.1.3 in conjunction with Direct Install.

Direct Install is funded through New Jersey's Clean Energy Program and is designed to provide capital for building energy upgrade projects to fast track implementation. The program will pay up to 60% of the costs for lighting, HVAC, motors, natural gas, refrigeration, and other equipment upgrades with higher efficiency alternatives. If a building is eligible for this funding, the Direct Install Program can significantly reduce the implementation cost of energy conservation projects.

The program pays a maximum amount of \$50,000 per building, and up to \$250,000 per customer per year. Installations must be completed by a Direct Install participating contractor, a list of which can be found on the New Jersey Clean Energy Website at <http://www.njcleanenergy.com>. Contractors will coordinate with the applicant to arrange installation of recommended measures identified in a previous energy assessment, such as this document.

6.2 Building Incentives

6.2.1 New Jersey Pay For Performance Program

Under incentive #1 of the New Jersey Pay for Performance Program, City Hall may be eligible for about \$7,800 towards development of an Energy Reduction Plan, Police building \$1,100, and Courthouse \$4,700. Each building does not have a dedicated electric meter and gas meter; therefore, it is not possible to develop a baseline energy load and values for Incentives #2 and #3 of the P4P Program could not be determined at this time.

6.2.2 New Jersey Smart Start Program

All three City buildings are eligible for incentives available under 2011 New Jersey Smart Start Program. The total amount of qualified incentives is about \$3,645 and includes the following:

| | |
|-------------|---|
| City Hall: | \$1,600 towards high efficiency air conditioners |
| Police: | \$2,800 towards high efficiency air conditioners |
| Courthouse: | \$500 towards premium efficiency motors and more efficient heat pumps |

6.2.3 Energy Efficient and Conservation Block Grant

All three buildings may be eligible for the first section of the EECBG and may be eligible for funding from the approximately \$61 million for local government buildings and facilities. This money is distributed using a population and energy-consumption based formula and is managed by the Treasury Department's Office of Energy Savings.

6.2.4 ARRA Initiative "Energy Efficiency Programs through the Clean Energy Program"

Newark City Hall, Police and Courthouse all pay the Societal Benefits charge on their monthly utility bill and therefore are not eligible for this incentive.

6.2.5 Direct Install Program

The City Hall is potentially eligible to receive funding from the Direct Install Program. This funding has the potential to significantly affect the payback periods of Energy Conservation Measures. This money can be in conjunction with the Energy Efficiency and Conservation Block Grant

For the City Hall, the total implementation cost for all ECMs potentially eligible for Direct Install funding is about \$318,000 towards replacement of air conditioners. This program would pay up to 60%, or about \$190,800 of these initial costs.

For the Police building, the total implementation cost for all ECMs potentially eligible for Direct Install funding is about \$120,000 towards replacement of air conditioners. This program would pay up to 60%, or about \$72,000 of the initial costs.

For the Courthouse, the total implementation cost for all ECMs potentially eligible for Direct Install funding is about \$8,300 towards installing premium efficiency motors and heat pumps. This program would pay up to 60%, or about \$5,000 of initial costs.

7.0 ALTERNATIVE ENERGY SCREENING EVALUATION

7.1 Geothermal

Geothermal heat pumps (GHP) transfer heat between the constant temperature of the earth and the building to maintain the building's interior space conditions. Below the surface of the earth throughout New Jersey the temperature remains in the low 50°F range throughout the year. This stable temperature provides a source for heat in the winter and a means to reject excess heat in the summer. With GHP systems, water is circulated between the building and the piping buried in the ground. The ground heat exchanger in a GHP system is made up of a closed or open loop pipe system. Most common is the closed loop in which high density polyethylene pipe is buried horizontally at 4-6 feet deep or vertically at 400 feet deep. These pipes are filled with an environmentally friendly antifreeze/water solution that acts as a heat exchanger. In the summer, the water picks up heat from the building and moves it to the ground. In the winter the system reverses and fluid picks up heat from the ground and moves it to the building. Heat pumps make collection and transfer of this heat to and from the building possible.

The City Hall Complex is located in an urban setting with no available area for a well field. Also, the existing HVAC systems of all three buildings would need to be fully converted to accommodate a ground source heat pump system. This measure is not recommended for any building.

7.2 Solar

7.2.1 Photovoltaic Rooftop Solar Power Generation

All three buildings were evaluated for the potential to install rooftop photovoltaic (PV) solar panels for power generation. Present technology incorporates the use of solar cell arrays that produce direct current (DC) electricity. This DC current is converted to alternating current (AC) with the use of an electrical device known as an inverter.

The State of New Jersey incentives for non-residential PV applications is \$0.75/watt up to 30 kW of installed PV array with a maximum system capacity of 50 kW. Federal tax credits are also available for renewable energy projects up to 30% of installation cost. Municipalities do not pay federal taxes; therefore, would not be able to utilize the federal tax credit incentive.

Installation of (PV) arrays in the state New Jersey will allow the owner to participate in the New Jersey solar renewable energy certificates program (SREC). This is a program that has been set up to allow entities with large amounts of environmentally unfriendly emissions to purchase credits from zero emission (PV) solar-producers. An alternative compliance penalty (ACP) is paid for by the high emission producers and is set each year on a declining scale of 3% per year. One SREC credit is equivalent to 1000 kilowatt hours of PV electrical production; these credits can be traded for period of 15 years from the date of installation. The cost of the ACP penalty for 2010 is \$700; this is the amount that must be paid per SREC by the high emission producers. The expected dollar amount that will be paid to the PV producer for 2011 is expected to be \$650/SREC credit. Payments that will be received from the PV producer will change from year to year dependent upon supply and demand. Renewable Energy Consultants is a third party SREC broker that has been approved by the New Jersey Clean Energy Program. As stated above there is no definitive way to calculate an exact price that will be received by the PV producer per SREC over the next 15 years. Renewable Energy Consultants estimated an average of \$487/ SREC per year and this number was utilized in the cash flow for this report.

This measure is not recommended for any building since there is not enough room for a solar array on any roof.

7.2.2 Solar Thermal Hot Water Plant

Active solar thermal systems use solar collectors to gather the sun's energy to heat water, another fluid, or air. An absorber in the collector converts the sun's energy into heat. The heat is then transferred by circulating water, antifreeze, or sometimes air to another location for immediate use or storage for later utilization. Applications for active solar thermal energy include providing hot water, heating swimming pools, space heating, and preheating air in residential and commercial buildings.

A standard solar hot water system is typically composed of solar collectors, heat storage vessel, piping, circulators, and controls. Systems are typically integrated to work alongside a conventional heating system that provides heat when solar resources are not sufficient. The solar collectors are usually placed on the roof of the building, oriented south, and tilted around the site's latitude, to maximize the amount of radiation collected on a yearly basis.

Several options exist for using active solar thermal systems for space heating. The most common method involves using glazed collectors to heat a liquid held in a storage tank (similar to an active solar hot water system). The most practical system would transfer the heat from the panels to thermal storage tanks and transfer solar produced thermal energy to use for domestic hot water production.

Currently, an incentive is not available for installation of thermal solar systems. A Federal tax credit of 30% of installation cost for the thermal applications is available; however, the City of Newark does not pay Federal taxes and, therefore, would not benefit from this program.

Solar Thermal Domestic Hot Water Plant – All Three City Hall Complex Buildings

| Budgetary Cost | Annual Utility Savings | | | Total Savings | New Jersey Renewable Energy Incentive | Payback (without incentive) | Payback (with incentive) |
|-------------------|------------------------|-------|-------------|------------------|--|-----------------------------------|-----------------------------|
| | Electricity | | Natural Gas | | | | |
| \$ | kW | kWh | Therms | \$ | \$ | Years | Years |
| 68,400 | 0 | 4,430 | 0 | 800 | 800 | NA | NA |

* No incentive is available in New Jersey at this time.

This measure is not recommended for any building due to poor payback and since there is limited area on each roof.

7.3 Wind

Small wind turbines use a horizontal axis propeller, or rotor, to capture the kinetic energy of the wind and convert it into rotary motion to drive a generator which usually is designed specifically for the wind turbine. The rotor consists of two or three blades, usually made from wood or fiberglass. These materials give the turbine the needed strength and flexibility, and have the added advantage of not interfering with television signals. The structural backbone of the wind turbine is the mainframe, and includes the slip-rings that connect the wind turbine, which rotates as it points into changing wind directions, and the fixed tower wiring. The tail aligns the rotor into the wind.

To avoid turbulence and capture greater wind energy, turbines are mounted on towers. Turbines should be mounted at least 30 feet above any structure or natural feature within 300 feet of the installation. Smaller turbines can utilize shorter towers. For example, a 250-watt turbine may be mounted on a 30-50 foot tower, while a 10 kW turbine will usually need a tower of 80-120 feet. Tower designs include tubular or latticed, guyed or self-supporting. Wind turbine manufacturers also provide towers.

The New Jersey Clean Energy Program for small wind installations has designated numerous pre-approved wind turbines for installation in the State of New Jersey. Incentives for wind turbine installations are based on kilowatt hours saved in the first year. Systems sized under 16,000 kWh per year of production will receive a \$3.20 per kWh incentive. Systems producing over 16,000 kWh will receive \$51,200 for the first 16,000 kWh of production with an additional \$0.50 per kWh up to a maximum cap of 750,000 kWh per year. Federal tax credits are also available for renewable energy projects up to 30% of installation cost for systems less than 100 kW. However, as noted previously, municipalities do not pay federal taxes and is, therefore, not eligible for the tax credit incentive.

Based upon the urban location of the three buildings, this measure is not recommended for any building.

7.4 Combined Heat and Power Generation (CHP)

Combined heat and power, cogeneration, is self-production of electricity on-site with beneficial recovery of the heat byproduct from the electrical generator. Common CHP equipment includes reciprocating engine-driven, micro turbines, steam turbines, and fuel cells. Typical CHP customers include industrial, commercial, institutional, educational institutions, and multifamily residential facilities. CHP systems that are commercially viable at the present time are sized approximately 50 kW and above, with numerous options in blocks grouped around 300 kW, 800 kW, 1,200 kW and larger. Typically, CHP systems are used to produce a portion of the electricity needed by a facility some or all of the time, with the balance of electric needs satisfied by purchase from the grid.

Any proposed CHP project will need to consider many factors, such as existing system load, use of thermal energy produced, system size, natural gas fuel availability, and proposed plant location. Purchasing this system and performing modifications to the existing HVAC and electrical systems would greatly outweigh the savings over the life of the equipment.

This measure is not recommended for any of the three buildings, but further study should be considered for the Powerhouse.

7.5 Biomass Power Generation

Biomass power generation is a process in which waste organic materials are used to produce electricity or thermal energy. These materials would otherwise be sent to the landfill or expelled to the atmosphere. To participate in NJCEP's Customer On-Site Renewable Energy program, participants must install an on-site sustainable biomass or fuel cell energy generation system. Incentives for bio-power installations are available to support up to 1MW-dc of rated capacity.

*Class I organic residues are eligible for funding through the NJCEP CORE program. Class I wastes include the following renewable supply of organic material:

- Wood wastes not adulterated with chemicals, glues or adhesives
- Agricultural residues (corn stover, rice hulls or nut shells, manures, poultry litter, horse manure, etc) and/or methane gases from landfills
- Food wastes
- Municipal tree trimming and grass clipping wastes
- Paper and cardboard wastes
- Non adulterated construction wood wastes, pallets

The NJDEP evaluates biomass resources not identified in the RPS.

Examples of eligible facilities for a CORE incentive include:

- Digestion of sewage sludge
- Landfill gas facilities
- Combustion of wood wastes to steam turbine
- Gasification of wood wastes to reciprocating engine
- Gasification or pyrolysis of bio-solid wastes to generation equipment

* from NJOCE Website

This measure is not recommended for any building because they do not have a steady waste stream to fuel the power generation system.

7.6 Demand Response Curtailment

Presently, electricity is delivered by PSE&G, which receives the electricity from regional power grid RFC. PJM is the regional transmission organization (RTO) that coordinates the movement of wholesale electricity in all or parts of 13 states and the District of Columbia including the State of New Jersey.

Utility Curtailment is an agreement with the PSE&G regional transmission organization and an approved Curtailment Service Provider (CSP) to shed electrical load by either turning major equipment off or energizing all or part of a facility utilizing an emergency generator; therefore, reducing the electrical demand on the utility grid. This program is to benefit the utility company during high demand periods and PSE&G offers incentives to the CSP to participate in this program. Enrolling in the program will require program participants to drop electrical load or turn on emergency generators during high electrical demand conditions or during emergencies. Part of the program also will require that program participants reduce their required load or run emergency generators with notice to test the system. A PSE&G pre-approved CSP will require a minimum of 100 kW of load reduction to participate in any curtailment program.

While each building may have the electrical loads to consider demand response curtailment, the ability to shed these loads would require shutting down major equipment such as air conditioning, lighting and other electrical devices to reduce electrical loads during high demand periods such as summer months. Due to this, this measure is not recommended.

8.0 EPA PORTFOLIO MANAGER

The United States Environmental Protection Agency (EPA) is a federal agency in charge of regulating environment waste and policy in the United States. The EPA has released the EPA Portfolio Manager for public use. The program is designed to allow property owners and managers to share, compare and improve upon their facility's energy consumption. Inputting such parameters as electricity, heating fuel, building characteristics and location into the website based program generates a naturalized energy rating score out of 100. Once an account is registered, monthly utility data can be entered to track the savings progress and retrieve an updated energy rating score on a monthly basis.

An EPA Portfolio Manager account was created and available utility data for the three buildings has been entered. However, none of the three buildings, (City Hall, Police and Courthouse) could generate a usable Site Energy Usage Index (EUI) nor overall score from the Portfolio Manager since not all the utilities are directly metered. In addition, the Courthouse building did not generate a statement of energy performance, but all the utility data was entered.

The City Hall has two electric feeds, one of which is unmetered from the Police building. In addition, steam used for heating comes from a central plant and is not submetered to the building.

The Courthouse has a dedicated electrical meter, but obtains heat from the central plant.

Should any of the buildings install an electric submeter for the power and flow meter for the steam, it may be possible to generate these values in the future.

An EPA Energy Star Portfolio Manager Report is located in Appendix D.

The user name and password for the building's EPA Portfolio Manager Account has been provided to Rich Lopez, Manager, Division of Public Buildings at the City of Newark.

9.0 CONCLUSIONS & RECOMMENDATIONS

The energy audit conducted by CHA at the City Hall, Police building, and Courthouse in Newark, New Jersey identified potential ECMs for air conditioner controls, radiator control valves, premium efficiency motors, insulation upgrade, and duct repair. Potential annual savings of \$48,430 may be realized for the recommended ECMs, with a summary of the costs, savings, and paybacks as follows:

9.1 City Hall

City Hall - ECM-1 Perimeter Air Conditioner Controls

| Budgetary Cost | Annual Utility Savings | | | | ROI | Potential Incentive* | Payback (without incentive) | Payback (with incentive) |
|----------------|------------------------|--------|-------------|--------|-----|----------------------|-----------------------------|--------------------------|
| | Electricity | | Natural Gas | Total | | | | |
| \$ | kW | kWh | Therms | \$ | | \$ | Years | Years |
| 45,900 | 0 | 86,200 | 0 | 15,500 | 4.1 | NA | 3.0 | NA |

* There is no incentive available through the New Jersey Smart Start Program for this ECM. See section 6.0 for other incentive opportunities.

City Hall - ECM-4 Air Conditioning Controls

| Budgetary Cost | Annual Utility Savings | | | | ROI | Potential Incentive* | Payback (without incentive) | Payback (with incentive) |
|----------------|------------------------|---------|-------------|--------|------|----------------------|-----------------------------|--------------------------|
| | Electricity | | Natural Gas | Total | | | | |
| \$ | kW | kWh | Therms | \$ | | \$ | Years | Years |
| 32,000 | 0 | 163,630 | 0 | 29,500 | 12.8 | NA | 1.1 | NA |

* There is no incentive available through the New Jersey Smart Start Program for this ECM. This measure is potentially eligible for Direct Install funding. See section 6.0 for other incentive opportunities.

9.2 Police Building

Police Building - ECM-1 Install Radiator Control Valve

| Budgetary Cost | Annual Utility Savings | | | | ROI | Potential Incentive* | Payback (without incentive) | Payback (with incentive) |
|----------------|------------------------|-----|-------------|-------|-----|----------------------|-----------------------------|--------------------------|
| | Electricity | | Natural Gas | Total | | | | |
| \$ | kW | kWh | Therms | \$ | | \$ | Years | Years |
| 130 | 0 | 0 | 30 | 30 | 1.4 | NA | 4.3 | NA |

* There is no incentive available through the New Jersey Smart Start Program for this ECM. This measure is potentially eligible for Direct Install funding. See section 6.0 for other incentive opportunities.

9.3 Courthouse Building

Courthouse - ECM-1 Premium Efficiency Motors

| Budgetary Cost | Annual Utility Savings | | | | ROI | Potential Incentive* | Payback (without incentive) | Payback (with incentive) |
|-------------------|------------------------|-------|-------------|-------|-----|-------------------------|--------------------------------|-----------------------------|
| | Electricity | | Natural Gas | Total | | | | |
| \$ | kW | kWh | Therms | \$ | | \$ | Years | Years |
| 7,800 | 0 | 9,210 | 0 | 1,400 | 2.2 | 400 | 5.6 | 5.3 |

*This incentive is available through the 2011 New Jersey Smart Start Program for this ECM. This measure is potentially eligible for Direct Install funding. See section 6.0 for other incentive opportunities.

Courthouse - ECM-2 Insulate Domestic Hot Water Tank

| Budgetary Cost | Annual Utility Savings | | | | ROI | Potential Incentive* | Payback (without incentive) | Payback (with incentive) |
|-------------------|------------------------|-----|-------------|-------|-----|-------------------------|--------------------------------|-----------------------------|
| | Electricity | | Natural Gas | Total | | | | |
| \$ | kW | kWh | Therms | \$ | | \$ | Years | Years |
| 5,700 | 0 | 0 | 1,130 | 1,200 | 2.2 | NA | 4.8 | NA |

*There is no incentive available through the New Jersey Smart Start Program for this ECM. See section 6.0 for other incentive opportunities.

As discussed in the report, CHA estimates up to an additional \$19,600 in annual energy savings could be achieved at the powerhouse building; therefore it is recommended that the City of Newark pursue a Local Government Energy Audit for this facility.

APPENDIX A

Utility Usage Analysis

City Hall Building

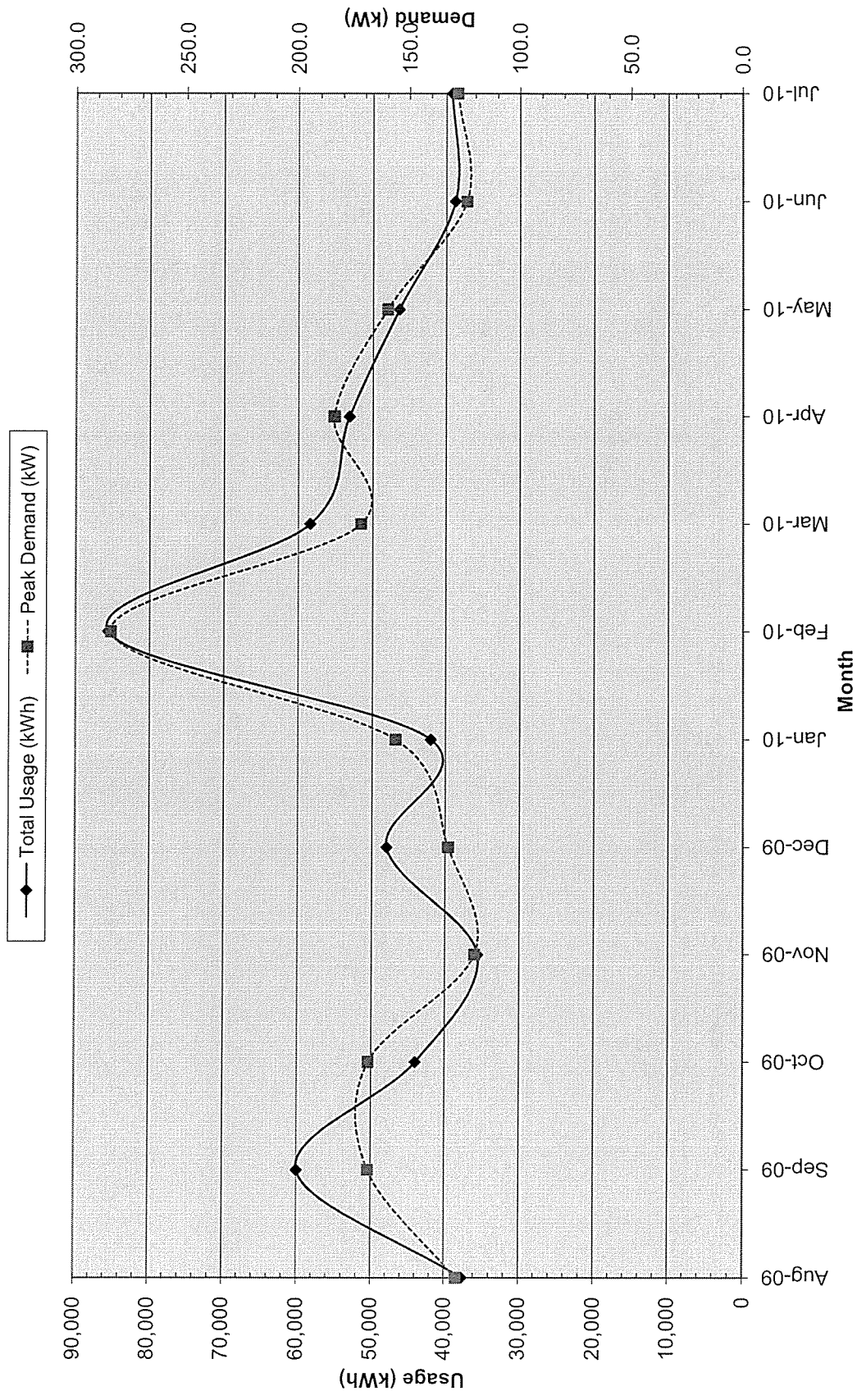
New Jersey BPU Energy Audit Program
CHA Project Number: 21823
City of Newark
PSEG

920 Broad Street
Account Number:
Meter 778015839

Demand Charges were not provided in documentation

| | | | Charges | | Unit Costs | | | |
|----------------|-------------------|--------------------|--------------|-------------|------------------|-----------------------|----------------------|----------------|
| Month | Consumption (kWh) | Billed Demand (kW) | Total (\$) | Demand (\$) | Consumption (\$) | Blended Rate (\$/kWh) | Consumption (\$/kWh) | Demand (\$/kW) |
| July-10 | 39,200 | 128.0 | \$6,435.00 | | \$6,435.00 | 0.1642 | 0.1642 | - |
| June-10 | 38,800 | 124.0 | \$6,410.00 | | \$6,410.00 | 0.1652 | 0.1652 | - |
| May-10 | 46,400 | 160.0 | \$8,322.00 | | \$8,322.00 | 0.1794 | 0.1794 | - |
| April-10 | 53,200 | 184.0 | \$11,035.00 | | \$11,035.00 | 0.2074 | 0.2074 | - |
| March-10 | 58,400 | 172.0 | \$11,587.00 | | \$11,587.00 | 0.1984 | 0.1984 | - |
| February-10 | 85,600 | 284.0 | \$20,052.00 | | \$20,052.00 | 0.2343 | 0.2343 | - |
| January-10 | 42,000 | 156.0 | \$6,860.00 | | \$6,860.00 | 0.1633 | 0.1633 | - |
| December-09 | 48,000 | 132.0 | \$7,600.00 | | \$7,600.00 | 0.1583 | 0.1583 | - |
| November-09 | 35,600 | 120.0 | \$6,188.00 | \$387.00 | \$5,801.00 | 0.1738 | 0.1629 | 3.23 |
| October-09 | 44,000 | 168.0 | \$6,987.00 | \$541.00 | \$6,446.00 | 0.1588 | 0.1465 | 3.22 |
| September-09 | 60,000 | 168.0 | \$8,537.00 | \$606.00 | \$7,931.00 | 0.1423 | 0.1322 | 3.61 |
| August-09 | 37,600 | 128.0 | \$6,105.00 | \$412.00 | \$5,693.00 | 0.1624 | 0.1514 | 3.22 |
| Total | | | \$106,118.00 | \$1,946.00 | \$104,172.00 | 0.1802 | 0.1769 | 3.33 |
| Most Recent Yr | | | \$106,118.00 | \$1,946.00 | \$104,172.00 | 0.1802 | 0.1769 | 3.33 |

Electric Usage



New Jersey BPU Energy Audit Program

CHA Project Number: 21823

City of Newark

PSEG

920 Broad Street

Account Number:

Cooking & backup generators or

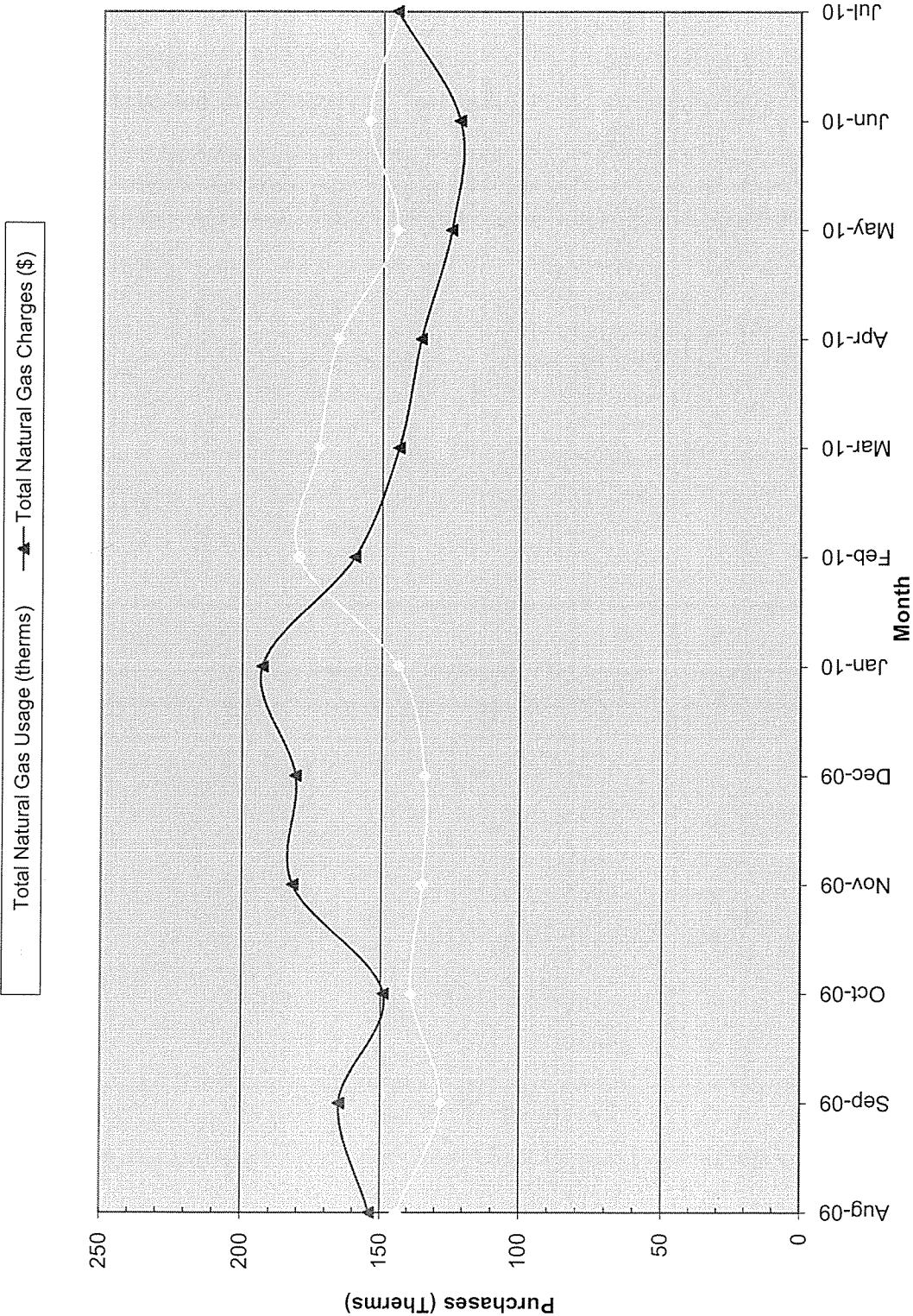
Meter

2805209

| Month | Therms | Charges (\$) | | (\$/therm) |
|--------------|--------|--------------|--------|------------|
| July-10 | 144 | \$ | 154.00 | \$ 1.07 |
| June-10 | 155 | \$ | 165.00 | \$ 1.06 |
| May-10 | 145 | \$ | 149.00 | \$ 1.03 |
| April-10 | 166 | \$ | 182.00 | \$ 1.10 |
| March-10 | 173 | \$ | 181.00 | \$ 1.05 |
| February-10 | 180 | \$ | 193.00 | \$ 1.07 |
| January-10 | 144 | \$ | 160.00 | \$ 1.11 |
| December-09 | 134 | \$ | 144.00 | \$ 1.07 |
| November-09 | 135 | \$ | 136.00 | \$ 1.01 |
| October-09 | 139 | \$ | 125.00 | \$ 0.90 |
| September-09 | 128 | \$ | 122.00 | \$ 0.95 |
| August-09 | 144 | \$ | 145.00 | \$ 1.01 |

| | | | | |
|----------------|-------|----|-------|---------|
| Total | 1,787 | \$ | 1,856 | \$ 1.04 |
| Most Recent Yr | 1,787 | \$ | 1,856 | \$ 1.04 |

Natural Gas Usage



Police Building

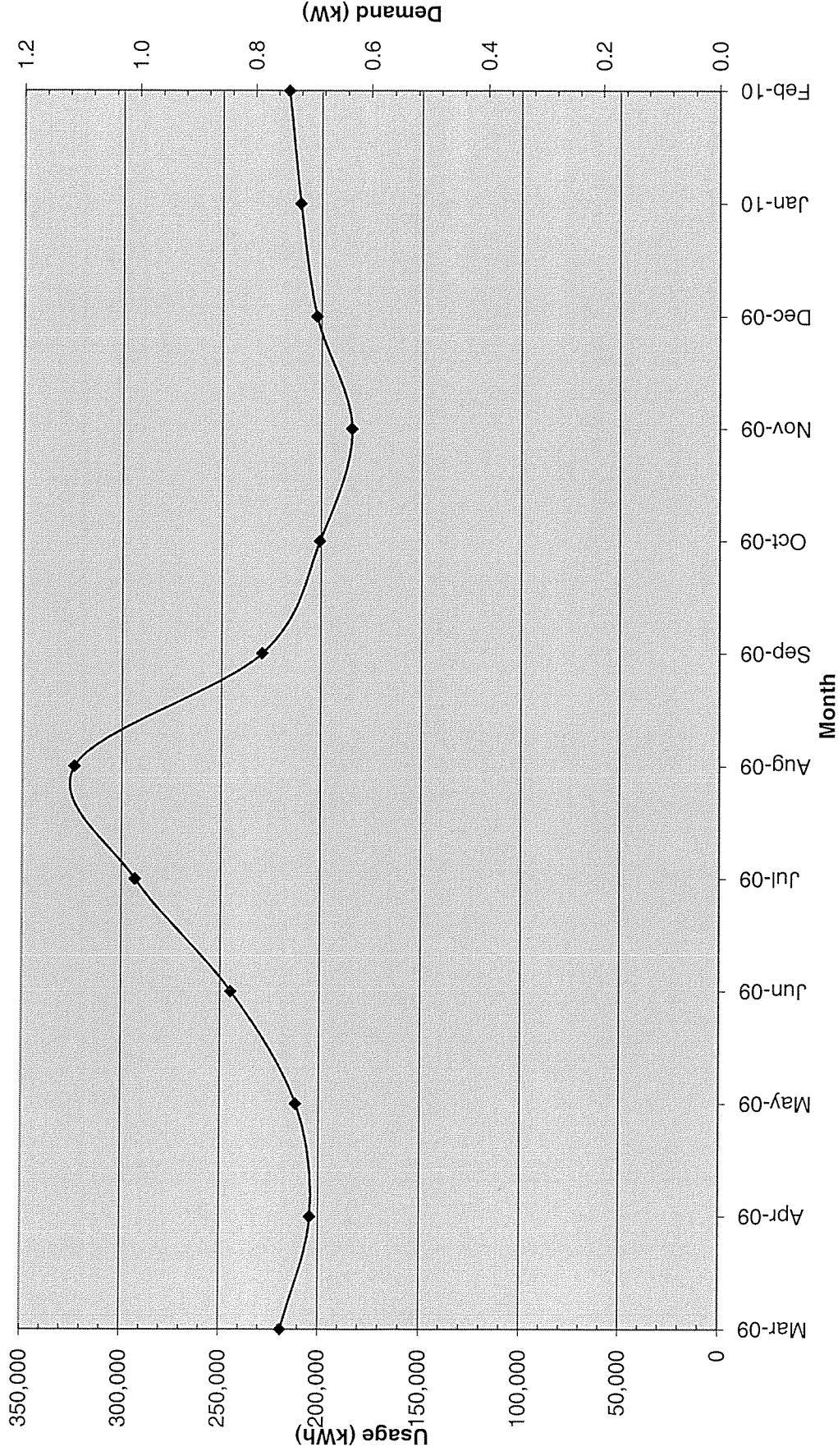
New Jersey BPU Energy Audit Program
CHA Project Number: 21823
City of Newark
PSEG

22 Franklin Street
Account Number: 4200218704
Meter 778004134
no demand information was provided.

| Month | Consumption (kWh) | Charges | Unit Costs |
|-----------------------|----------------------|---------------------|--------------------------|
| | | Total (\$) | Blended Rate (\$/kWh) |
| March-09 | 218,640 | \$33,306.00 | 0.1523 |
| April-09 | 204,097 | \$32,005.00 | 0.1568 |
| May-09 | 211,528 | \$32,190.00 | 0.1522 |
| June-09 | 244,600 | \$49,156.00 | 0.2010 |
| July-09 | 293,145 | \$56,016.00 | 0.1911 |
| August-09 | 323,747 | \$59,915.00 | 0.1851 |
| September-09 | 229,480 | \$44,864.00 | 0.1955 |
| October-09 | 200,525 | \$31,450.00 | 0.1568 |
| November-09 | 184,607 | \$29,249.00 | 0.1584 |
| December-09 | 202,293 | \$41,767.00 | 0.2065 |
| January-10 | 210,565 | \$41,270.74 | 0.1960 |
| February-10 | 216,357 | \$39,831.32 | 0.1841 |
| Total | 2,739,584 | \$491,020.06 | 0.1792 |
| Most Recent Yr | 2,739,584 | \$491,020.06 | 0.1792 |

Electric Usage - 22 Franklin Street

—◆— Total Usage (kWh)



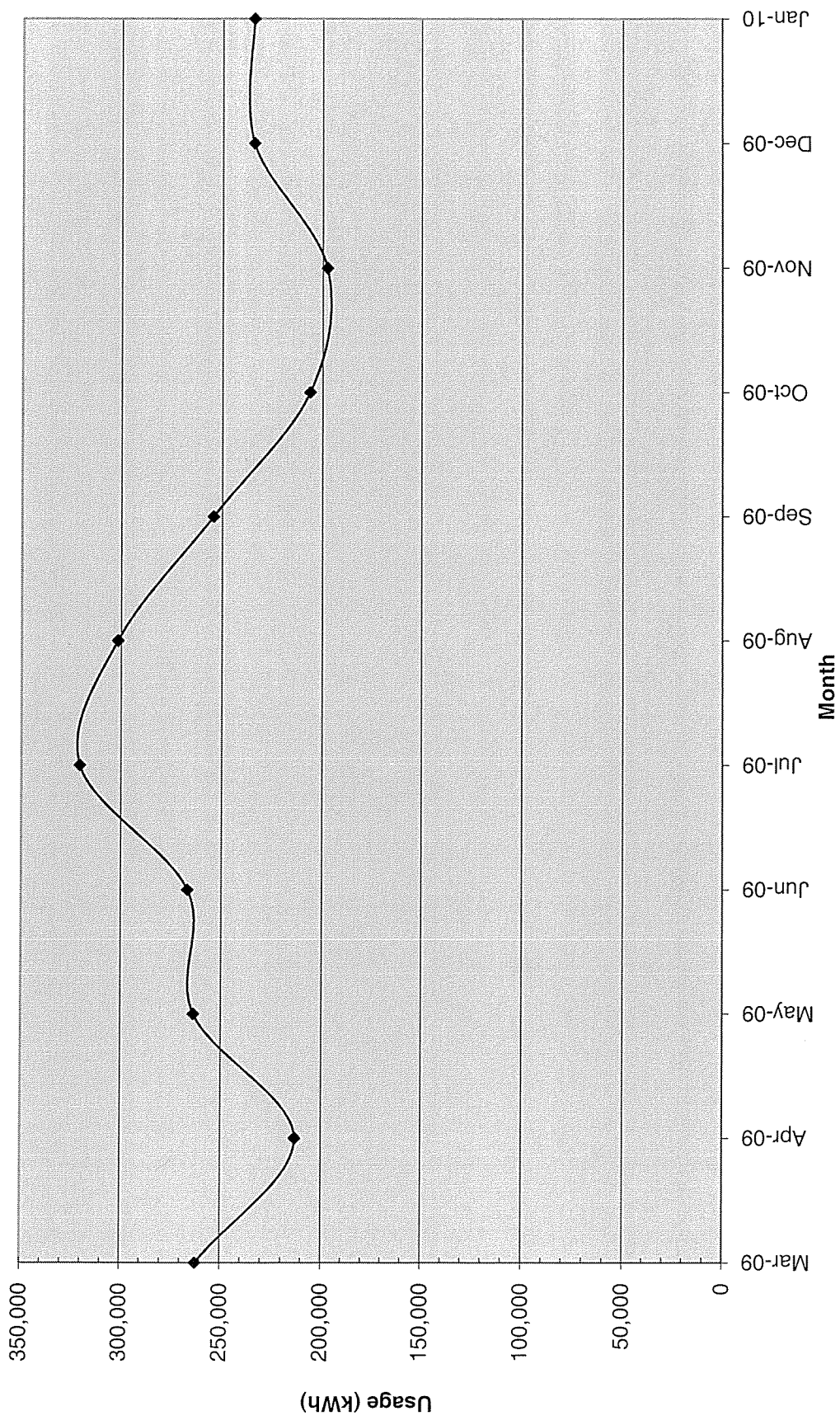
Courthouse

New Jersey BPU Energy Audit Program
 CHA Project Number: 21823
 City of Newark
 PSEG

31 Green Street
 Account Number:
 Meter 778015858

| <i>demand information was not available</i> | | Charges | Unit Costs |
|---|-------------------|-------------|-----------------------|
| Month | Consumption (kWh) | Total (\$) | Blended Rate (\$/kWh) |
| February-10 | 225,250 | \$30,634.00 | 0.1360 |
| January-10 | 234,264 | \$32,339.00 | 0.1380 |
| December-09 | 234,264 | \$32,339.00 | 0.1380 |
| November-09 | 197,647 | \$26,739.00 | 0.1353 |
| October-09 | 206,256 | \$29,209.00 | 0.1416 |
| September-09 | 254,230 | \$38,748.00 | 0.1524 |
| August-09 | 301,621 | \$50,312.00 | 0.1668 |
| July-09 | 320,599 | \$52,495.00 | 0.1637 |
| June-09 | 266,634 | \$44,778.00 | 0.1679 |
| May-09 | 263,532 | \$38,573.00 | 0.1464 |
| April-09 | 213,044 | \$29,686.00 | 0.1393 |
| March-09 | 262,168 | \$35,334.00 | 0.1348 |
| Total | | | 0.1481 |

Electric Usage - 31 Green Street



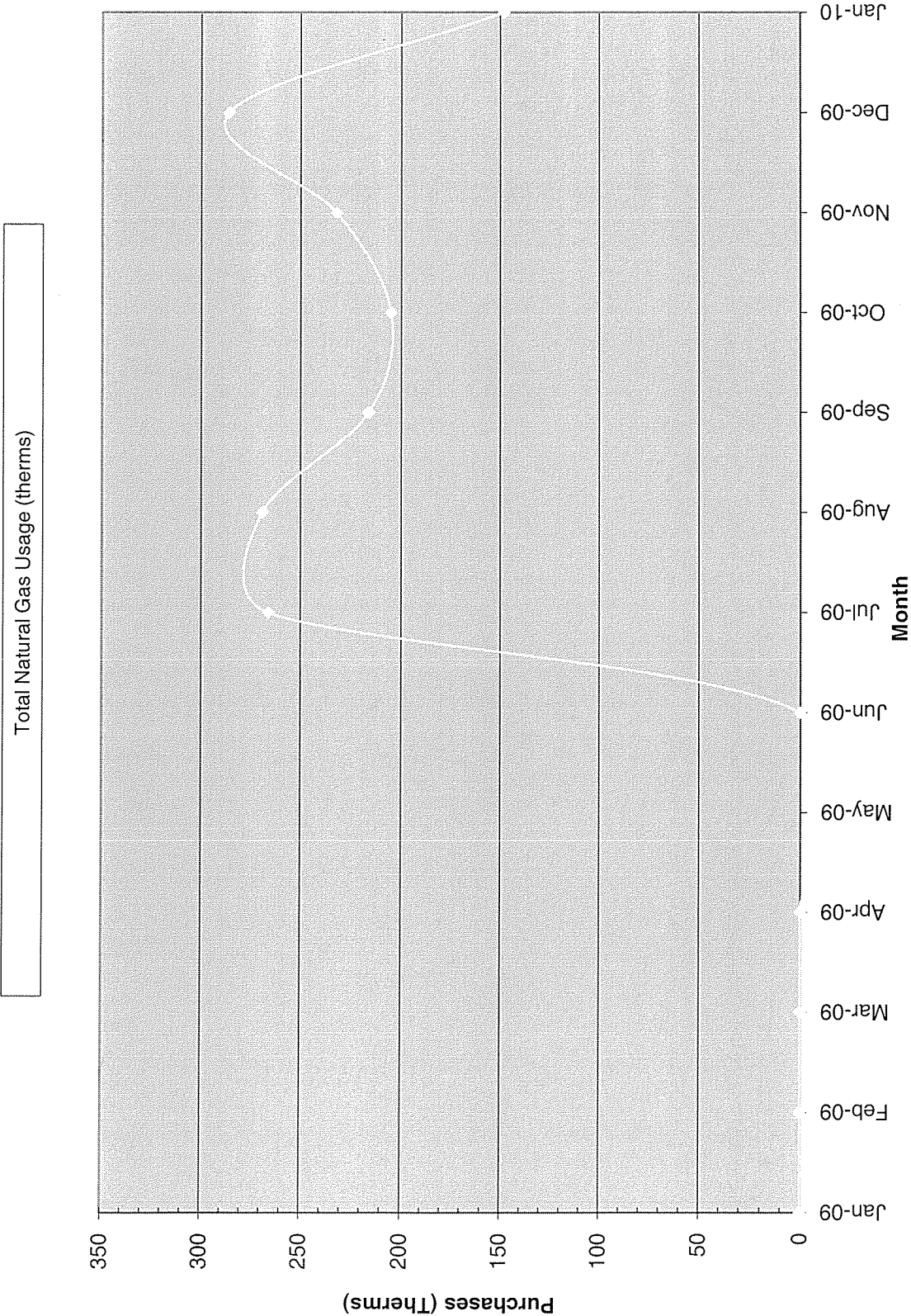
New Jersey BPU Energy Audit Program
 CHA Project Number: 21823
 City of Newark
 PSEG

31 Green Street
 Account Number:
 Meter 2805137

| Month | Therms | Charges (\$) | (\$/therm) |
|--------------|--------|--------------|------------|
| January-10 | 148 | \$ 164.00 | \$ 1.11 |
| December-09 | 286 | \$ 303.00 | \$ 1.06 |
| November-09 | 232 | \$ 229.00 | \$ 0.99 |
| October-09 | 205 | \$ 179.00 | \$ 0.87 |
| September-09 | 216 | \$ 200.00 | \$ 0.93 |
| August-09 | 269 | \$ 261.00 | \$ 0.97 |
| July-09 | 266 | \$ 247.00 | \$ 0.93 |
| June-09 | 0 | \$ 10.00 | - |
| April-09 | 0 | \$ 9.00 | - |
| March-09 | 0 | \$ 9.00 | - |
| February-09 | 0 | \$ 9.00 | - |
| January-09 | 0 | \$ 9.00 | - |

| | | | |
|----------------|-------|----------|---------|
| Total | 1,622 | \$ 1,629 | \$ 1.00 |
| Most Recent Yr | 1,622 | \$ 1,629 | \$ 1.00 |

Natural Gas Usage - 31 Green Street



ELECTRIC MARKETERS LIST

The following is a listing of marketers/suppliers/brokers that have been licensed by the NJ Board of Public Utilities to sell electricity to residential, small commercial and industrial customers served by the Public Service Electric and Gas Company distribution system. **This listing is provided for informational purposes only and PSE&G makes no representations or warranties as to the competencies of the entities listed herein or to the completeness of this listing.**

American Powernet Management
867 Berkshire Blvd, Suite 101
Wyomissing, PA 19610
www.americanpowernet.com

Gerdau Ameristeel Energy Co.
North Crossman Road
Sayreville, NJ 08872

PPL EnergyPlus, LLC
Energy Marketing Center
Two North Ninth Street
Allentown, PA 18101
1-866-505-8825
<http://www.pplenergyplus.com/>

BOC Energy Services
575 Mountain Avenue
Murray Hill, NJ 08002
www.boc-gases.com

Gexa Energy LLC New Jersey
20 Greenway Plaza, Suite 600
Houston, TX 77046
(866) 304-GEXA
Beth.miller@gexaenergy.com

Sempra Energy Solutions
The Mac-Cali Building
581 Main Street, 8th Floor
Woodbridge, NJ 07095
(877) 273-6772
www.SempraSolutions.com

Commerce Energy Inc.
535 Route 38, Suite 138
Cherry Hill, NJ 08002
(888) 817-8572 or
(858) 910-8099
www.commerceenergy.com

Glacial Energy of New Jersey
2602 McKinney Avenue, Suite 220
Dallas, TX 75204
www.glacialenergy.com

South Jersey Energy Company
1 South Jersey Plaza, Route 54
Folsom, NJ 08037
(800) 756-3749
www.sjindustries.com

ConEdison Solutions
701 Westchester Avenue
Suite 201 West
White Plains, NY 10604
(800) 316-8011
www.ConEdSolutions.com

Hess Corporation
1 Hess Plaza
Woodbridge, NJ 07095
www.hcss.com

Strategic Energy, LLC
6 East Main Street, Suite 6E
Ramsey, NJ 07446
(888) 925-9115
www.sel.com

Constellation NewEnergy, Inc.
1199 Route 22 East
Mountainside, NJ 07092
908 228-5100
www.newenergy.com

Integrus Energy Services, Inc
99 Wood Avenue, Suite 802
Iselin, NJ 08830
www.integrusenergy.com

Suez Energy Resources NA
333 Thornall Street FL6
Edison, NJ 08818
866.999.8374(toll free)
www.suezenergyresources.com

Credit Suisse (USA), Inc.
700 College Road East
Princeton, NJ 08450
www.creditsuisse.com

Liberty Power Delaware, LLC
1901 W Cypress Road, Suite 600
Fort Lauderdale, FL 33309
(866) Power-99
(866) 769-3799
www.libertypowercorp.com

UGI Energy Services, Inc.
d/b/a POWERMARK
1 Meridian Blvd. Suite 2C01
Wyomissing, PA 19610
(800) 427-8545
www.ugienergyservices.com

Direct Energy Services, LLC
One Gateway Center, Suite 2600
Newark, NJ 07102
(973) 799-8568
www.directenergy.com

Liberty Power Holdings, LLC
1901 W Cypress Creek Road, Suite 600
Fort Lauderdale, FL 33309
(866) Power-99
(866) 769-3799
www.libertypowercorp.com

FirstEnergy Solutions
395 Ghent Road Suite 407
Akron, OH 44333
(800) 977-0500
www.fes.com

Pepco Energy Services, Inc.
d/b/a Power Choice
23 S. Kinderkamack Rd Ste D
Montvale, NJ 07645
(800) 363-7499
www.pepco-services.com

GAS MARKETERS LIST

The following is a listing of marketers/suppliers/brokers that have been licensed by the NJ Board of Public Utilities to sell natural gas to residential, small commercial and industrial customers served by the Public Service Electric and Gas Company distribution system. **This listing is provided for informational purposes only and PSE&G makes no representations or warranties as to the competencies of the entities listed herein or to the completeness of this listing.**

Gateway Energy Services
44 Whispering Pines Lane
Lakewood, NJ 08701
(800) 805-8586
www.gesc.com

Metro Energy Group, LLC
14 Washington Place
Hackensack, NJ 07601
www.metroenergy.com

RPL Holdings, Inc
601 Carlson Pkwy
Minnetonka, MN 55305

Great Eastern Energy
3044 Coney Island Ave. PH
Brooklyn, NY 11235
888-651-4121
www.greateasterngas.com

Metromedia Energy, Inc.
6 Industrial Way
Eatontown, NJ 07724
(800) 828-9427
www.metromediaenergy.com

South Jersey Energy Company
One South Jersey Plaza, Rte 54
Folsom, NJ 08037
(800) 756-3749
www.sjindustries.com/sje.htm

Hess Corporation
1 Hess Plaza
Woodbridge, NJ 07095
(800) 437-7872
www.hess.com

Mitchell- Supreme Fuel
(NATGASCO)
532 Freeman Street
Orange, NJ 07050
(800) 840-4GAS
www.mitchellsupreme.com

Sprague Energy Corp.
Two International Drive, Ste 200
Portsmouth, NH 03801
800-225-1560
www.spragueenergy.com

Hudson Energy Services, LLC
545 Route 17 South
Ridgewood, NJ 07450
(201) 251-2400
www.hudsonenergyservices.com

MxEnergy Inc.
P.O. Box 177
Annapolis Junction, MD 20701
800-375-1277
www.mxenergy.com

Stuyvesant Energy LLC
642 Southern Boulevard
Bronx, NY 10455
(718) 665-5700
www.stuyfuel.com

Intelligent Energy
7001 SW 24th Avenue
Gainesville, FL 32607
Sales: 1 877 I've Got Gas
(1 877 483-4684)
Customer Service:
1 800 927-9794
www.intelligentenergy.org

Pepco Energy Services, Inc.
23 S Kinderkamack Rd, Suite D
Montvale, NJ 07645
(800) 363-7499
www.pepco-services.com

Tiger Natural Gas, Inc.
1422 E. 71st Street, Suite J.
Tulsa, OK 74136
1-888-875-6122
www.tignaturalgas.com

Systrum Energy
877-SYSTRUM
(877-797-8786)
www.systrumenergy.com

Plymouth Rock Energy, LLC
165 Remsen Street
Brooklyn, NJ 11201
866-539-6450
www.plymouthrockenergy.com

UGI Energy Services, Inc.
d/b/a GASMARK
704 E. Main Street, Suite I
Moorestown, NJ 08057
856-273-9995
www.ugienergyservices.com

Macquarie Cook Energy, LLC
10100 Santa Monica Blvd, 18th
Fl
Los Angeles, CA 90067

PPL EnergyPlus, LLC
Energy Marketing Center
Two North Ninth Street
Allentown, PA 18101
1-866-505-8825
www.pplenergyplus.com/natural+gas/

Woodruff Energy
73 Water Street
P.O. Box 777
Bridgeton, NJ 08302
(856) 455-1111
www.woodruffenergy.com

APPENDIX B

ECM Listings

City Hall Building

City of Newark
CHA #21823
Building: 920 Broad Street

ECM-1- Perimeter AC Controls

Reduce operating times of Perimeter Window AC units.

| ASSUMPTIONS | | Comments |
|------------------------------|---------------|----------|
| Electric Cost | \$0.180 / kWh | |
| Current run hours per Week | 168 Hours | |
| Proposed run hours per week. | 60 Hours | |
| Space Balance Point | 55 F | |
| Space Temperature Setpoint | 70 deg F | setpoint |
| Existing Total tons | 118 tons | |
| Average KW/ton | 1.2 | |

| Item | Value | Units | Comments |
|--------------------------------|---------|-------|----------|
| Existing Annual Electric Usage | 134,088 | kWh | |
| Proposed Annual Electric Usage | 47,888 | kWh | |

| ANNUAL SAVINGS | |
|---------------------|------------|
| Annual Savings | 86,199 kWh |
| Annual Cost Savings | \$15,535 |

| OAT - DB Bin Temp F | Annual Hours | Cooling Hrs at Temp Above balance point | Assumed % of time of operation | Existing hrs of Operation | Proposed cooling hours above balance setpoint | Assumed % of time of operation | Proposed hours of operation |
|---------------------------|-----------------|---|--------------------------------------|---------------------------------|--|--------------------------------------|-----------------------------------|
| 102.5 | 0 | 0 | 100% | 0 | 0 | 100% | 0 |
| 97.5 | 3 | 3 | 89% | 3 | 1 | 89% | 1 |
| 92.5 | 34 | 34 | 79% | 27 | 12 | 79% | 10 |
| 87.5 | 131 | 131 | 68% | 90 | 47 | 68% | 32 |
| 82.5 | 500 | 500 | 58% | 289 | 179 | 58% | 103 |
| 77.5 | 620 | 620 | 47% | 294 | 221 | 47% | 105 |
| 72.5 | 664 | 664 | 37% | 245 | 237 | 37% | 87 |
| 67.5 | 854 | 0 | 0% | 0 | 0 | 0% | 0 |
| 62.5 | 927 | 0 | 0% | 0 | 0 | 0% | 0 |
| 57.5 | 600 | 0 | 0% | 0 | 0 | 0% | 0 |
| 52.5 | 610 | 0 | 0% | 0 | 0 | 0% | 0 |
| 47.5 | 611 | 0 | 0% | 0 | 0 | 0% | 0 |
| 42.5 | 656 | 0 | 0% | 0 | 0 | 0% | 0 |
| 37.5 | 1,023 | 0 | 0% | 0 | 0 | 0% | 0 |
| 32.5 | 734 | 0 | 0% | 0 | 0 | 0% | 0 |
| 27.5 | 334 | 0 | 0% | 0 | 0 | 0% | 0 |
| 22.5 | 252 | 0 | 0% | 0 | 0 | 0% | 0 |
| 17.5 | 125 | 0 | 0% | 0 | 0 | 0% | 0 |
| 12.5 | 47 | 0 | 0% | 0 | 0 | 0% | 0 |
| 7.5 | 22 | 0 | 0% | 0 | 0 | 0% | 0 |
| 2.5 | 13 | 0 | 0% | 0 | 0 | 0% | 0 |
| -2.5 | 0 | 0 | 0% | 0 | 0 | 0% | 0 |
| -7.5 | 0 | 0 | 0% | 0 | 0 | 0% | 0 |
| Total | 8,760 | 1,952 | 49% | 947 | | | 338 |

City of Newark
CHA #21823
Building: 920 Broad Street

| | |
|-------------|------|
| Multipliers | |
| Material: | 0.98 |
| Labor: | 1.21 |
| Equipment: | 1.09 |

[illegible]

| | | |
|----|---------------|----------------------|
| \$ | 35,872 | Subtotal |
| \$ | 7,174 | 20% Contingency |
| \$ | 2,870 | Contractor 8% O&P |
| \$ | - | 0% Engineering |
| \$ | 45,916 | Total |

City of Newark
CHA #21823
Building: 920 Broad Street

ECM-2- Replace AC Units Serving Basement

Replace Old Basement AC units with high efficiency air cooled units.

| ASSUMPTIONS | | | Comments |
|------------------------------|---------|-------|--------------------------------------|
| Electric Cost | \$0.180 | / kWh | |
| Current run hours per Week | 60 | Hours | |
| Proposed run hours per week. | 60 | Hours | |
| Space Balance Point | 55 | F | |
| Space Temperature Setpoint | 70 | deg F | setpoint |
| Existing Total tons | 80 | tons | Cooling capacity of 4 Basement Units |
| Existing KW/ton | 1.6 | | |
| Proposed KW/ton | 1.2 | | |

| Item | Value | Units | Comments |
|--------------------------------|--------|-------|----------|
| Existing Annual Electric Usage | 43,289 | kWh | |
| Proposed Annual Electric Usage | 32,467 | kWh | |

| ANNUAL SAVINGS | | |
|---------------------|---------|-----|
| Annual Savings | 12,111 | kWh |
| Annual Cost Savings | \$2,183 | |

| OAT - DB Bin Temp F | Annual Hours | Cooling Hrs at Temp Above balance point | Assumed % of time of operation | Existing hrs of Operation | 5 hp tower pump existing kWhr |
|---------------------------|-----------------|---|--------------------------------------|---------------------------------|----------------------------------|
| 102.5 | 0 | 0 | 100% | 0 | 0 |
| 97.5 | 3 | 1 | 89% | 1 | 4 |
| 92.5 | 34 | 12 | 79% | 10 | 37 |
| 87.5 | 131 | 47 | 68% | 32 | 122 |
| 82.5 | 500 | 179 | 58% | 103 | 394 |
| 77.5 | 620 | 221 | 47% | 105 | 400 |
| 72.5 | 664 | 237 | 37% | 87 | 333 |
| 67.5 | 854 | 0 | 0% | 0 | 0 |
| 62.5 | 927 | 0 | 0% | 0 | 0 |
| 57.5 | 600 | 0 | 0% | 0 | 0 |
| 52.5 | 610 | 0 | 0% | 0 | 0 |
| 47.5 | 611 | 0 | 0% | 0 | 0 |
| 42.5 | 656 | 0 | 0% | 0 | 0 |
| 37.5 | 1,023 | 0 | 0% | 0 | 0 |
| 32.5 | 734 | 0 | 0% | 0 | 0 |
| 27.5 | 334 | 0 | 0% | 0 | 0 |
| 22.5 | 252 | 0 | 0% | 0 | 0 |
| 17.5 | 125 | 0 | 0% | 0 | 0 |
| 12.5 | 47 | 0 | 0% | 0 | 0 |
| 7.5 | 22 | 0 | 0% | 0 | 0 |
| 2.5 | 13 | 0 | 0% | 0 | 0 |
| -2.5 | 0 | 0 | 0% | 0 | 0 |
| -7.5 | 0 | 0 | 0% | 0 | 0 |
| Total | 8,760 | 697 | 49% | 338 | 1288 |

City of Newark

CHA #21823

Building: 920 Broad Street

ECM-3 Window Replacement

*Change U-value and air infiltration rates based on new windows or storm windows
See block load spreadsheet for U-values

Description Windows can lead to increased energy consumption due to infiltration/exfiltration and heat gain/loss. Replacing older windows with more panes and low-emissivity coatings and insulated frames can decrease energy usage.

| | | |
|-------------|--|------------------------|
| Given | Occupied Cooling Hours per Week | 60 Hours |
| | Occupied Heating Hours per Week | 60 Hours |
| | Heating Energy Cost | \$107.58/therm |
| | Cooling Cost | \$1.93/SkWh |
| | Occupied Cooling Setpoint Temperature | 72.0 Degrees F |
| | Occupied Cooling Avg Space Air Enthalpy | 26.5 Btu/lb |
| | Occupied Heating Setpoint Temperature | 68.0 Degrees F |
| | Unoccupied Heating Setpoint Temperature | 68.0 Degrees F |
| | Window Area | 14,000 sq.ft. |
| | Window Perimeter | 4,200 ft. |
| Assumptions | Proposed U factor | 0.50 Btu/(h*sqft*degf) |
| | Proposed Air Infiltration | 0.20 cfm/ft |
| | Cooling Conversion | 12,000 Btu/ton |
| | Heating Btu Conversion | 1,000,000 Btu/MMBtu |
| | Existing U factor | 1.10 Btu/(h*sqft*degf) |
| | Existing Air Infiltration | 1.00 cfm/ft |
| | Heating System Efficiency | 80% |
| | Cooling System Efficiency | 1.20 kW/ton |
| | Cooling Energy Conduction = (Existing U x Area x (OA Temp - RA Temp) x Op Hours) | |
| | Heating Energy Conduction = (Existing U x Area x (RA Temp - OA Temp) x Op Hours) | |

Formula Cooling Energy Conduction = (Existing U x Area x (OA Temp - RA Temp) x Op Hours)

Heating Energy Conduction = (Existing U x Area x (RA Temp - OA Temp) x Op Hours)
Cooling Energy Infiltration = (4.5 x Leakage x Perimeter x (OA Enthalpy - RA Enthalpy) x Op Hours)
Heating Energy Infiltration = 1.08 x Leakage x Perimeter x (RA Temp - OA Temp) x Op Hours
Load = (Conduction) + (Infiltration)
Cooling Energy = (Cooling Load) / (12,000 Btu/Ton) x (kW/Ton)
Heating Energy = (Heating Load) / (1,000,000 Btu/MMBtu) / (Boiler Efficiency)
Energy Cost = (Energy) x (Cost/Unit)

| Existing | Operation | OA Enthalpy | OA Temp | Total Hours | Cooling Hours | Heating Occupied Hours | Heating Unoccupied Hours | Cooling Occupied Hours | Heating Occupied Conduction | Heating Unoccupied Conduction | Cooling Infiltration | Heating Occupied Infiltration | Heating Unoccupied Infiltration |
|----------|------------|-------------|---------|-------------|---------------|------------------------|--------------------------|------------------------|-----------------------------|-------------------------------|----------------------|-------------------------------|---------------------------------|
| | Cooling | 38.3 | 92.5 | 37 | 13.2 | 0.0 | 0.0 | 3,764.750 | 0 | 0 | 0 | 0 | 0 |
| | Cooling | 36.6 | 87.5 | 131 | 48.6 | 0.0 | 0.0 | 9,726.750 | 0 | 0 | 0 | 0 | 0 |
| | Cooling | 33.5 | 82.5 | 500 | 178.6 | 0.0 | 0.0 | 23,375.000 | 0 | 0 | 0 | 0 | 0 |
| | Cooling | 31.6 | 77.5 | 620 | 221.4 | 0.0 | 0.0 | 11,835.000 | 0 | 0 | 0 | 0 | 0 |
| | Heating | 30.3 | 72.5 | 664 | 0.0 | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Heating | 27.9 | 67.5 | 854 | 0.0 | 305.0 | 549.0 | 0 | 2,346.500 | 4,227.300 | 0 | 691.740 | 1,245.132 |
| | Heating | 24.6 | 62.5 | 927 | 0.0 | 331.1 | 595.9 | 0 | 28,041.750 | 50,475.150 | 0 | 8,259.570 | 14,867.226 |
| | Heating | 21.6 | 57.5 | 600 | 0.0 | 214.3 | 385.7 | 0 | 34,650.000 | 62,370.000 | 0 | 10,206.000 | 18,370.800 |
| | Heating | 18.7 | 52.5 | 611 | 0.0 | 217.9 | 392.1 | 0 | 52,002.500 | 93,604.500 | 0 | 15,317.100 | 27,570.780 |
| | Heating | 16.2 | 47.5 | 611 | 0.0 | 234.3 | 421.7 | 0 | 66,890.250 | 124,002.450 | 0 | 20,291.310 | 36,524.358 |
| | Heating | 14.3 | 42.5 | 656 | 0.0 | 234.3 | 421.7 | 0 | 92,004.000 | 165,607.200 | 0 | 27,099.360 | 48,776.848 |
| | Heating | 10.4 | 37.5 | 1,023 | 0.0 | 365.4 | 657.6 | 0 | 171,608.250 | 308,894.850 | 0 | 50,546.430 | 90,983.574 |
| | Heating | 8.7 | 32.5 | 794 | 0.0 | 262.1 | 471.9 | 0 | 143,313.500 | 257,954.300 | 0 | 42,212.340 | 75,862.212 |
| | Heating | 7.4 | 27.5 | 334 | 0.0 | 119.3 | 214.7 | 0 | 74,398.500 | 133,917.300 | 0 | 21,913.740 | 39,444.732 |
| | Heating | 6.1 | 22.5 | 252 | 0.0 | 90.0 | 162.0 | 0 | 63,063.000 | 113,513.400 | 0 | 18,574.920 | 33,434.866 |
| | Heating | 5.4 | 17.5 | 425 | 0.0 | 44.6 | 80.4 | 0 | 34,718.750 | 62,493.750 | 0 | 10,226.260 | 18,407.280 |
| | Heating | 3.9 | 12.5 | 425 | 0.0 | 16.8 | 30.2 | 0 | 1,330.500 | 2,504.500 | 0 | 4,225.770 | 7,606.366 |
| | Heating | 2.5 | 7.5 | 22 | 0.0 | 7.9 | 14.6 | 0 | 7,329.500 | 13,576.500 | 0 | 2,142.420 | 3,911.150 |
| | Heating | 1.2 | 2.5 | 13 | 0.0 | 4.6 | 8.4 | 0 | 4,683.250 | 8,429.850 | 0 | 1,379.430 | 2,462.974 |
| | Heating | -0.2 | -2.5 | 0 | 0.0 | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Heating | -1.4 | -7.5 | 0 | 0.0 | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Subtotal = | | | 8,760 | 460 | 2,431 | 4,377 | 48,801,500 | 791,389,500 | 1,424,501,100 | 65,540,475 | 233,100,180 | 419,580,324 |

| | | |
|-----------------------|---|-------------------|
| Cooling Load = | (48801500) + (65540475) = | 114,341,975 btu |
| Cooling Energy = | (114341975) / (12000) * (1.20) = | 11634 kWh |
| Cooling Energy Cost = | (114341975) * (\$0.180) = | \$ 2,060.76 |
| Heating Load = | (221580000) + (652600504) = | 2,868,571,104 btu |
| Heating Energy = | (288591104) / (80%) * (1000000) = | 35,657 therms |
| Heating Energy Cost = | (35657.14) * (\$1.067) = | \$ 38,244 |

| Operation | OA Enthalpy | OA Temp | Total Hours | Cooling Hours | Heating Occupied Hours | Heating Unoccupied Hours | Cooling Occupied Conduction | Heating Occupied Conduction | Unoccupied Conduction | Cooling Occupied Infiltration | Heating Occupied Infiltration | Heating Unoccupied Infiltration |
|------------|-------------|---------|-------------|---------------|------------------------|--------------------------|-----------------------------|-----------------------------|-----------------------|-------------------------------|-------------------------------|---------------------------------|
| Cooling | 38.3 | 82.5 | 37 | 13.2 | 0.0 | 0.0 | 0 | 0 | 0 | 639,360 | 0 | 0 |
| Cooling | 36.6 | 87.5 | 131 | 46.8 | 0.0 | 0.0 | 4,431,250 | 0 | 0 | 1,763,005 | 0 | 0 |
| Cooling | 33.5 | 82.5 | 500 | 178.6 | 0.0 | 0.0 | 10,625,000 | 0 | 0 | 5,160,005 | 0 | 0 |
| Cooling | 31.6 | 77.5 | 620 | 221.4 | 0.0 | 0.0 | 5,425,000 | 0 | 0 | 5,105,700 | 0 | 0 |
| Cooling | 30.3 | 72.5 | 664 | 0.0 | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Heating | 27.9 | 67.5 | 854 | 0.0 | 305.0 | 549.0 | 0 | 1,067,500 | 1,921,500 | 0 | 138,348 | 249,026 |
| Heating | 24.6 | 62.5 | 927 | 0.0 | 331.1 | 595.9 | 0 | 12,746,250 | 22,943,250 | 0 | 1,651,914 | 2,973,445 |
| Heating | 21.6 | 57.5 | 600 | 0.0 | 214.3 | 385.7 | 0 | 15,750,000 | 28,350,000 | 0 | 2,041,200 | 3,674,160 |
| Heating | 18.7 | 52.5 | 610 | 0.0 | 217.9 | 392.1 | 0 | 23,637,500 | 42,547,500 | 0 | 3,063,420 | 5,514,156 |
| Heating | 16.2 | 47.5 | 611 | 0.0 | 218.2 | 392.8 | 0 | 31,313,750 | 56,384,750 | 0 | 4,058,262 | 7,304,872 |
| Heating | 14.3 | 42.5 | 656 | 0.0 | 234.3 | 421.7 | 0 | 41,820,000 | 75,276,000 | 0 | 5,419,872 | 9,755,770 |
| Heating | 12.4 | 37.5 | 1,023 | 0.0 | 365.4 | 657.6 | 0 | 78,003,750 | 140,466,750 | 0 | 10,109,286 | 18,196,715 |
| Heating | 10.4 | 32.5 | 734 | 0.0 | 282.1 | 471.9 | 0 | 85,142,500 | 117,256,500 | 0 | 8,442,468 | 15,196,442 |
| Heating | 8.7 | 27.5 | 334 | 0.0 | 119.3 | 214.7 | 0 | 33,817,500 | 60,871,500 | 0 | 4,382,748 | 7,886,946 |
| Heating | 7 | 22.5 | 252 | 0.0 | 90.0 | 162.0 | 0 | 28,665,000 | 51,597,000 | 0 | 3,714,984 | 6,686,971 |
| Heating | 5.4 | 17.5 | 145 | 0.0 | 44.6 | 80.4 | 0 | 15,781,250 | 28,406,250 | 0 | 2,045,250 | 3,681,450 |
| Heating | 3.9 | 12.5 | 47 | 0.0 | 19.6 | 30.2 | 0 | 6,921,250 | 11,736,250 | 0 | 845,154 | 1,521,277 |
| Heating | 2.5 | 7.5 | 22 | 0.0 | 9.8 | 14.4 | 0 | 3,167,500 | 5,889,500 | 0 | 431,244 | 776,239 |
| Heating | 1.2 | 2.5 | 13 | 0.0 | 4.8 | 8.4 | 0 | 2,126,750 | 3,831,750 | 0 | 275,886 | 496,595 |
| Heating | -0.2 | -2.5 | 0 | 0.0 | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Heating | -1.4 | -7.5 | 0 | 0.0 | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Subtotal = | | | 8,760 | 460 | 2,431 | 4,377 | 22,182,500 | 359,722,500 | 647,500,500 | 13,108,065 | 46,620,036 | 83,916,065 |

| | | |
|-----------------------|--|-----------------------------|
| Cooling Load = | Conduction | Infiltration |
| | $22182500 \times (1 - 13108095) =$ | |
| Cooling Energy = | Cooling Load | $35,290,595 \text{ btu}$ |
| | 35290595 Yr | |
| Cooling Energy Cost = | Cooling Energy | Cooling Cost |
| | $352905 \times (12000 \times 1.20) =$ | 3529 kWh |
| | $352905 \times (30180) =$ | |
| Heating Load = | Conduction | Infiltration |
| | $103726301 \times (13638101) =$ | |
| Heating Energy = | Heating Load | Heating Cost |
| | 1137769101 Yr | $1,137,769,101 \text{ btu}$ |
| | $1137769101 \times (80\%) \times (100000) =$ | 14222 therms |
| Heating Energy Cost = | Heating Energy | Heating Cost |
| | $1422199 \times (\$1.067) =$ | $\$ 15,169$ |

Summary

| | | |
|-------------------------|-----------------|--------------|
| EXISTING COOLING ENERGY | 11434.20 kWh | \$ 2,060.76 |
| EXISTING HEATING ENERGY | 35657.14 therms | \$ 38,243.61 |
| EXISTING ENERGY COST | | \$ 40,304.37 |
| PROPOSED COOLING ENERGY | 3529.06 kWh | \$ 636.03 |
| PROPOSED HEATING ENERGY | 14221.99 therms | \$ 15,168.53 |
| PROPOSED ENERGY COST | | \$ 15,804.57 |
| COOLING ENERGY SAVINGS | 7905.14 kWh | \$ 1,424.72 |
| HEATING ENERGY SAVINGS | 21635.15 therms | \$ 23,075.08 |
| ENERGY COST SAVINGS | | \$ 24,499.80 |

69.1% of existing
60.9% of existing
60.8% of existing

Comments

City of Newark
CHA #21823
Building: 920 Broad Street

ECM-4- AC Controls

Reduce operating times of Interior split system AC units.

| ASSUMPTIONS | | Comments |
|------------------------------|---------------|----------|
| Electric Cost | \$0.180 / kWh | |
| Current run hours per Week | 168 Hours | |
| Proposed run hours per week. | 60 Hours | |
| Space Balance Point | 55 F | |
| Space Temperature Setpoint | 70 deg F | setpoint |
| Existing Total tons | 192 tons | |
| Average KW/ton | 1.4 | |

| Item | Value | Units | Comments |
|--------------------------------|---------|-------|----------|
| Existing Annual Electric Usage | 254,539 | kWh | |
| Proposed Annual Electric Usage | 90,907 | kWh | |

| ANNUAL SAVINGS | | |
|---------------------|----------|-----|
| Annual Savings | 163,633 | kWh |
| Annual Cost Savings | \$29,491 | |

| OAT - DB Bin Temp F | Annual Hours | Cooling Hrs at Temp Above balance point | Assumed % of time of operation | Existing hrs of Operation | Proposed cooling hours above balance setpoint | Assumed % of time of operation | Proposed hours of operation |
|---------------------------|-----------------|---|--------------------------------------|---------------------------------|--|--------------------------------------|-----------------------------------|
| 102.5 | 0 | 0 | 100% | 0 | 0 | 100% | 0 |
| 97.5 | 3 | 3 | 89% | 3 | 1 | 89% | 1 |
| 92.5 | 34 | 34 | 79% | 27 | 12 | 79% | 10 |
| 87.5 | 131 | 131 | 68% | 90 | 47 | 68% | 32 |
| 82.5 | 500 | 500 | 58% | 289 | 179 | 58% | 103 |
| 77.5 | 620 | 620 | 47% | 294 | 221 | 47% | 105 |
| 72.5 | 664 | 664 | 37% | 245 | 237 | 37% | 87 |
| 67.5 | 854 | 0 | 0% | 0 | 0 | 0% | 0 |
| 62.5 | 927 | 0 | 0% | 0 | 0 | 0% | 0 |
| 57.5 | 600 | 0 | 0% | 0 | 0 | 0% | 0 |
| 52.5 | 610 | 0 | 0% | 0 | 0 | 0% | 0 |
| 47.5 | 611 | 0 | 0% | 0 | 0 | 0% | 0 |
| 42.5 | 656 | 0 | 0% | 0 | 0 | 0% | 0 |
| 37.5 | 1,023 | 0 | 0% | 0 | 0 | 0% | 0 |
| 32.5 | 734 | 0 | 0% | 0 | 0 | 0% | 0 |
| 27.5 | 334 | 0 | 0% | 0 | 0 | 0% | 0 |
| 22.5 | 252 | 0 | 0% | 0 | 0 | 0% | 0 |
| 17.5 | 125 | 0 | 0% | 0 | 0 | 0% | 0 |
| 12.5 | 47 | 0 | 0% | 0 | 0 | 0% | 0 |
| 7.5 | 22 | 0 | 0% | 0 | 0 | 0% | 0 |
| 2.5 | 13 | 0 | 0% | 0 | 0 | 0% | 0 |
| -2.5 | 0 | 0 | 0% | 0 | 0 | 0% | 0 |
| -7.5 | 0 | 0 | 0% | 0 | 0 | 0% | 0 |
| Total | 8,760 | 1,952 | 49% | 947 | | | 338 |

Police Building

City of Newark
CHA #21823
22 Franklin Street

ECM-1 Install Radiator Control Valve

Provide a manual control valve on a typical perimeter radiator.

| | |
|--|-------|
| Heating System Efficiency | 80% |
| Max Heat loss for 10ftx10ft office(Btu/hr) | 2,436 |
| | ** |

**estimated calculation for one 10ftx10 ft office to include one window, outside wall and infiltration.

| Temperature (F) | Bin Hrs (hrs) | Occupied Hours | Existing (No Controls) | | Proposed (With Controls) | |
|--------------------|------------------|----------------|------------------------|--------------------------------|--------------------------|--------------------------------|
| | | | Capacity (%) | Heating Energy (BTU/season) | Capacity (%) | Heating Energy (BTU/season) |
| 52.5 | 610 | 218 | 100% | 663,375 | 10% | 66,338 |
| 47.5 | 611 | 218 | 100% | 664,463 | 20% | 132,893 |
| 42.5 | 656 | 234 | 100% | 713,400 | 30% | 214,020 |
| 37.5 | 1,023 | 365 | 100% | 1,112,513 | 40% | 445,005 |
| 32.5 | 734 | 262 | 100% | 798,225 | 50% | 399,113 |
| 27.5 | 334 | 119 | 100% | 363,225 | 60% | 217,935 |
| 22.5 | 252 | 90 | 100% | 274,050 | 70% | 191,835 |
| 17.5 | 125 | 45 | 100% | 135,938 | 80% | 108,750 |
| 12.5 | 47 | 17 | 100% | 51,113 | 85% | 43,446 |
| 7.5 | 22 | 8 | 100% | 23,925 | 90% | 21,533 |
| 2.5 | 13 | 5 | 100% | 14,138 | 100% | 14,138 |
| Totals | | | | 4,814,363 | | 1,855,003 |
| | | | | | | 2,959,359 |

| | | |
|--|--|-------------|
| Annual Therm Savings per office | | 29.6 |
|--|--|-------------|

City of Newark
CHA #21823
Building: 22 Franklin Street

ECM-2: Replace AC Units with High Efficiency Units
Replace 35 tons of split system cooling with new machines.

| ASSUMPTIONS | | | | Comments |
|-----------------------------|---------|---------------|---------|----------|
| Electric Cost | | \$0.180 / kWh | | |
| Existing run hours per Week | 60 | Hours | | |
| Space Balance Point | 55 | F | | |
| Space Temperature Setpoint | 70 | deg F | | |
| Total capacity (BTU / Hr) | 420,000 | BTU / Hr | 35 tons | |
| Average EER | 8.0 | | | |

| Item | Value | Units | Comments |
|--------------------------------|--------|-------|----------|
| Existing Annual Electric Usage | 17,755 | kWh | |
| Proposed EER | 14.0 | | |
| Proposed Annual Electric Usage | 10,146 | kWh | |

| ANNUAL SAVINGS | |
|---------------------|-----------|
| Annual Savings | 7,609 kWh |
| Annual Cost Savings | \$1,370 |

| OAT - DB Bin Temp F | Annual Hours | Cooling Hrs at Temp Above balance point | Assumed % of time of operation | Assumed Hrs of Operation |
|---------------------------|-----------------|---|--------------------------------------|--------------------------------|
| 102.5 | 0 | 0 | 100% | 0 |
| 97.5 | 3 | 1 | 89% | 1 |
| 92.5 | 34 | 12 | 79% | 10 |
| 87.5 | 131 | 47 | 68% | 32 |
| 82.5 | 500 | 179 | 58% | 103 |
| 77.5 | 620 | 221 | 47% | 105 |
| 72.5 | 664 | 237 | 37% | 87 |
| 67.5 | 854 | 0 | 0% | 0 |
| 62.5 | 927 | 0 | 0% | 0 |
| 57.5 | 600 | 0 | 0% | 0 |
| 52.5 | 610 | 0 | 0% | 0 |
| 47.5 | 611 | 0 | 0% | 0 |
| 42.5 | 656 | 0 | 0% | 0 |
| 37.5 | 1,023 | 0 | 0% | 0 |
| 32.5 | 734 | 0 | 0% | 0 |
| 27.5 | 334 | 0 | 0% | 0 |
| 22.5 | 252 | 0 | 0% | 0 |
| 17.5 | 125 | 0 | 0% | 0 |
| 12.5 | 47 | 0 | 0% | 0 |
| 7.5 | 22 | 0 | 0% | 0 |
| 2.5 | 13 | 0 | 0% | 0 |
| -2.5 | 0 | 0 | 0% | 0 |
| -7.5 | 0 | 0 | 0% | 0 |
| Total | 8,760 | 697 | | 338 |

City of Newark
CHA #21823
Building: 22 Franklin Street

ECM-2: Replace AC Units with High Efficiency Units

| Multipliers | |
|-------------|------|
| Material: | 0.98 |
| Labor: | 1.21 |
| Equipment: | 1.09 |

| Description | QTY | UNIT | UNIT COSTS | | | SUBTOTAL COSTS | | | TOTAL COST | REMARKS |
|---------------------------------------|-----|------|------------|----------|----------|----------------|----------|----------|------------|---------|
| | | | MAT. | LABOR | EQUIP. | MAT. | LABOR | EQUIP. | | |
| Records Room (10 ton) | 1 | EA | \$ 7,200 | \$ 4,500 | | \$ 7,056 | \$ 5,445 | \$ - | \$ 12,501 | |
| Front Vestibule (5 Ton) | 1 | EA | \$ 4,500 | \$ 4,500 | | \$ 4,410 | \$ 5,445 | \$ - | \$ 9,855 | |
| 4th Flr major Crime Units (5 ton) | 1 | EA | \$ 4,500 | \$ 4,500 | | \$ 4,410 | \$ 5,445 | \$ - | \$ 9,855 | |
| 4th Floor Homicide(10ton) | 1 | EA | \$ 7,200 | \$ 4,500 | | \$ 7,056 | \$ 5,445 | \$ - | \$ 12,501 | |
| 3rd flr Criminal Investigation(5 ton) | 1 | EA | \$ 4,500 | \$ 4,500 | | \$ 4,410 | \$ 5,445 | \$ - | \$ 9,855 | |
| | | | | | | \$ - | \$ - | \$ - | \$ - | |
| ductwork reconnections | 5 | EA | \$ 900 | \$ 900 | | \$ 4,410 | \$ 5,445 | \$ - | \$ 9,855 | |
| electrical power | 5 | EA | \$ 1,250 | \$ 1,250 | | \$ 6,125 | \$ 7,563 | \$ - | \$ 13,688 | |
| new thermostats | 5 | EA | \$ 300 | \$ 300 | | \$ 1,470 | \$ 1,815 | \$ - | \$ 3,285 | |
| demolition | 5 | EA | \$ 800 | \$ 800 | | \$ 3,920 | \$ 4,840 | \$ - | \$ 8,760 | |
| Crane | 1 | EA | | | \$ 2,000 | \$ - | \$ - | \$ 2,180 | \$ 2,180 | |

| | |
|------------|-----------------|
| \$ 92,335 | Subtotal |
| \$ 13,850 | 15% Contingency |
| \$ 13,850 | Contractor |
| \$ - | 15% O&P |
| \$ 120,035 | 0% Engineering |
| \$ 120,035 | Total |

Courthouse

| Demand | |
|--------|-------------|
| Cost | \$/kW-month |
| | |

| Energy | |
|--------|---------|
| Cost | \$/kWh |
| | \$ 0.15 |

| Material | | Manpower | |
|----------|-------|----------|-----------|
| Material | Labor | Labor | Equipment |
| | | | |

| Savings Analysis | | | | | | | | | | | |
|------------------|-----------------------------|----------|-------------|-------------|---------------------|----------------|--------------------------|-----------------|----------------|----------------|-------------------|
| # | Description | Location | Existing HP | Load Factor | Existing Efficiency | Existing kW | Existing HP ^a | New Load Factor | New Efficiency | New kW | Demand Savings \$ |
| 1 | Cooling Tower (Cell 1) | Roof | 10 | 0.9 | 0.870 | 7.7 | 10 | 0.9 | 0.910 | 7.5 | 0.340 \$ |
| 2 | Cooling Tower (Cell 2) | Roof | 10 | 0.9 | 0.870 | 7.7 | 10 | 0.9 | 0.915 | 7.3 | 0.386 \$ |
| 3 | Cooling Tower (Cell 3) | Roof | 10 | 0.9 | 0.870 | 7.7 | 10 | 0.9 | 0.916 | 7.3 | 0.398 \$ |
| 4 | Main Circulation Pump (P-1) | Roof MER | 40 | 0.9 | 0.880 | 39.5 | 40 | 0.9 | 0.940 | 29.5 | 1.385 \$ |
| 5 | Hot Water Pump (P-3) | Roof MER | 20 | 0.9 | 0.880 | 19.5 | 20 | 0.9 | 0.934 | 14.4 | 0.878 \$ |
| | Total | | 90 | | | 68.9 | 90 | | | 64.9 | 4.03 \$ |
| Cost Estimates | | | | | | | | | | | |
| | | | Unit Costs | | | Subtotal Costs | | | Payback | | |
| | | | Materials | Labor | Equipment | Materials | Labor | Equipment | Years | Estimated Cost | Total Cost |
| | | | \$ 748 | \$ 270 | \$ - | \$ 734 | \$ 327 | \$ - | 12.4 | \$ 1,001 | \$ 1,581 |
| | | | \$ 748 | \$ 270 | \$ - | \$ 734 | \$ 327 | \$ - | 12.4 | \$ 1,001 | \$ 1,581 |
| | | | \$ 748 | \$ 270 | \$ - | \$ 734 | \$ 327 | \$ - | 12.4 | \$ 1,001 | \$ 1,581 |
| | | | \$ 2,253 | \$ 600 | \$ - | \$ 2,268 | \$ 726 | \$ - | 3.8 | \$ 2,834 | \$ 2,834 |
| | | | \$ 1,818 | \$ 450 | \$ - | \$ 1,194 | \$ 344 | \$ - | 5.0 | \$ 1,878 | \$ 1,878 |

ECM-2 Insulating Domestic Hot Water Tank

Description Insulate existing domestic hot water tank of 3 ft x 12ft that is not currently insulated to reduce heat loss from the tank.
Calculation based upon equivalent surface area of tank (56 ft of 8" pipe.)

| | | | |
|-------|---|---|------------|
| Given | Fuel Energy Cost(assumed) | = | |
| | Operation (Hours/Week) | = | 168 |
| | Operation (Heating Weeks/Year) | = | 52 |
| | Operation (Hours/Year) | = | 8736 |
| | Heating Media | = | Steam |
| | Heating Material | = | Mild Steel |
| | Ambient Temperature (average for entire year) | = | 60 °F |

| | | | | | | | | | | | | |
|---|---------|---|------------|---------|---|------------|---------|---|------------|---------|---|------------|
| Pipe Diameter (Amount Equivalent to tank) | Pipe #1 | 8 | 100 inches | Pipe #2 | 2 | 100 inches | Pipe #3 | 4 | 100 inches | Pipe #4 | 2 | 100 inches |
| Pipe Length | | | 56.00 feet | | | 0.00 feet | | | 0.00 feet | | | 0.00 feet |

| | | | | | | | | | | |
|----------------------------------|--|--|------|--------|------|--------|------|--------|------|-----------------|
| Min. Pipe Insulation Recommended | | | 2.00 | inches | 1.00 | inches | 1.50 | inches | 1.00 | inches |
| Circulating Temperature | | | | | | | | | 120 | 1 °F |
| Heating Efficiency (assumed) | | | | | | | | | 80% | |
| Pipe Insulation Conductivity | | | | | | | | | 0.29 | Btu*in/(h*12°F) |

Formula Piping Correction Factor = (Current Transmission Coefficient / Reference Transmission Coefficient)
Temperature Correction Factor = (Circulating Temperature - Ambient Temperature) / (Circulating Temperature - Reference Temperature)
Hourly Heat Loss per pipe size and length = (Heat loss per foot (from chart) x (Piping Correction Factor) x (Temperature Correction Factor) x (Pipe Length)
Seasonal Heat Loss = (Hourly Heat Loss Total) x (Operating hours) / (Heating Efficiency) / (1,000 btu/Mbtu)

Energy Loss = (Seasonal Heat Loss) / (Conversion Factor [MBtu/Unit])
Energy Loss Cost = (Energy Loss) x (cost/unit)

| | | | |
|-----------------------------------|----------------------------------|------------------------------------|-------------------|
| Existing | Current Transmission Coefficient | Reference Transmission Coefficient | |
| Piping Correction Factor = (| 2.50 | / | 2.50 |
| Temperature Correction Factor = (| Circulating Temp. | Ambient Temp. | Circulating Temp. |
| | 120 - | 60 | 120 - |
| | | | 80 |
| | | | |
| Heat Loss Pipe #1 (Hourly) | 140.00 | x (| 1.00 |
| Heat Loss Pipe #2 (Hourly) | 42.93 | x (| 1.00 |
| Heat Loss Pipe #3 (Hourly) | 76.95 | x (| 1.00 |
| Heat Loss Pipe #4 (Hourly) | 42.93 | x (| 1.00 |
| Seasonal Heat Loss | 11,760 |) x (| 8,736 |
| Existing Energy Loss | 128,415 |) / (| 100 |
| Existing Energy Loss Cost | 1,284 |) x (| \$ 1.07 |

| | | | | | |
|----------------------------|--------------------|-----------|----------------|-------------|-------|
| New | Heat Loss per foot | Piping CF | Temperature CF | Pipe Length | |
| Heat Loss Pipe #1 (Hourly) | 16.50 | x (| 1.00 | x (| 56.00 |
| Heat Loss Pipe #2 (Hourly) | 13.00 | x (| 1.00 | x (| 0.00 |
| Heat Loss Pipe #3 (Hourly) | 16.00 | x (| 1.00 | x (| 0.00 |
| Heat Loss Pipe #4 (Hourly) | 13.00 | x (| 1.00 | x (| 0.00 |
| Seasonal Heat Loss | 1,386 |) x (| 8,736 |) / (| 1,000 |
| New Energy Loss | 15,135 |) / (| 100 | | |
| New Energy Loss Cost | 151 |) x (| \$ 1.07 | | |

| | | | |
|--------------------|-------|-------|----------------|
| Existing Heat Loss | 1,284 | Therm | \$ 1,374 |
| New Heat Loss | 151 | Therm | \$ 162 |
| Savings | 100% | 1,133 | Therm \$ 1,212 |
| | | | 88.2% |

Building: 31 Green Street

ECM-2 Insulating Domestic Hot Water Tank

| | |
|--------------------|------|
| Multipliers | |
| Material: | 0.98 |
| Labor: | 1.21 |
| Equipment: | 1.09 |

[illegible]

| | | |
|--|-----------------|--------------------|
| | \$ 4,900 | Subtotal |
| | \$ 245 | 5% Contingency |
| | \$ 515 | 10% Contractor O&P |
| | \$ - | Engineering |
| | \$ 5,660 | Total |

City of Newark
CHA #21823
Building: 31 Green Street

ECM-3 Seal Roof Ducts

Summary

Seal existing openings on supply and return ductwork on roof to minimize duct leakage.

| | |
|--|------|
| Existing Summer Supply Temp (F) | 55 |
| Existing Winter Supply Temperature (F) | 80.0 |
| Existing Summer Return Air Temp (F) | 72.0 |
| Existing Winter Return Air Temp (F) | 68.0 |
| kW/Ton | 1.9 |

| OAT - DB Avg Temp F (A) | CFM Leaking (estimated) 500 | Annual Hours in Bin (C) | Delta T | Energy (Btu/hr) | Energy (Btu) | Kwhr | Therms |
|----------------------------------|-----------------------------------|-----------------------------------|---------|-----------------|--------------|-------|--------|
| 102.5 | 500 | 1 | 17 | 9,180 | 9,180 | 1.6 | 18 |
| 97.5 | 500 | 12 | 17 | 9,180 | 9,180 | 17.6 | 18 |
| 92.5 | 500 | 47 | 17 | 9,180 | 9,180 | 68.0 | 19 |
| 87.5 | 500 | 179 | 17 | 9,180 | 9,180 | 259.6 | 30 |
| 82.5 | 500 | 221 | 17 | 9,180 | 9,180 | 321.8 | 21 |
| 77.5 | 500 | 237 | 17 | 9,180 | 9,180 | 344.7 | 10 |
| 72.5 | 500 | 305 | 17 | 9,180 | 9,180 | 443.3 | 7 |
| 67.5 | 500 | 331 | 17 | 9,180 | 9,180 | 481.2 | 4 |
| 62.5 | 500 | 214 | 17 | 9,180 | 9,180 | 311.5 | 1 |
| 57.5 | 500 | 218 | -12 | -6,480 | 1,411,714 | 0.0 | 0 |
| 52.5 | 500 | 218 | -12 | -6,480 | 1,414,029 | 0.0 | 0 |
| 47.5 | 500 | 234 | -12 | -6,480 | 1,518,171 | 0.0 | 0 |
| 42.5 | 500 | 365 | -12 | -6,480 | 2,367,514 | 0.0 | 0 |
| 37.5 | 500 | 262 | -12 | -6,480 | 1,698,686 | 0.0 | 0 |
| 32.5 | 500 | 119 | -12 | -6,480 | 772,971 | 0.0 | 0 |
| 27.5 | 500 | 90 | -12 | -6,480 | 583,200 | 0.0 | 0 |
| 22.5 | 500 | 45 | -12 | -6,480 | 289,286 | 0.0 | 0 |
| 17.5 | 500 | 17 | -12 | -6,480 | 108,771 | 0.0 | 0 |
| 12.5 | 500 | 8 | -12 | -6,480 | 50,914 | 0.0 | 0 |
| 7.5 | 500 | 5 | -12 | -6,480 | 30,086 | 0.0 | 0 |
| 2.5 | 500 | 0 | -12 | -6,480 | 0 | 0.0 | 0 |
| -2.5 | 500 | 0 | -12 | -6,480 | 0 | 0.0 | 0 |
| -7.5 | 500 | 0 | -12 | -6,480 | 0 | 0.0 | 0 |
| | | 3,129 | -3 | | 10,245,343 | 2,249 | 128 |

| | |
|---------|------|
| Savings | |
| Kwhr | 2249 |
| Therms | 128 |

ECM-3 Seal Roof Ducts

[illegible]

| | | |
|----|-------|-------------------|
| \$ | 2,648 | Subtotal |
| \$ | 265 | 10% Contingency |
| \$ | 233 | 8% Contractor O&P |
| \$ | - | 0% Engineering |
| \$ | 3,146 | Total |

City of Newark
CHA #21823
31 Green Street

ECM-4 Purchase More Efficient Heat Pump for Perimeter Offices

Cost of Electric \$ 0.148 /kwh

| Efficiency | Standard | High Efficiency |
|---------------|----------|-----------------|
| EER | 8 | 14 |
| Btu/unit | 12,000 | 12,000 |
| watts per ton | 1,500 | 857 |

| Temperature (F) | Bin Hrs (hrs) | Capacity (%) | Usage - 8 EER (kWh/ton) | Usage - 14 EER (kWh/ton) |
|--------------------|------------------|-----------------|----------------------------|-----------------------------|
| 102.5 | 0 | 100% | 0 | 0 |
| 97.5 | 3 | 90% | 4 | 2 |
| 92.5 | 34 | 80% | 41 | 23 |
| 87.5 | 131 | 70% | 138 | 79 |
| 82.5 | 500 | 60% | 450 | 257 |
| 77.5 | 620 | 50% | 465 | 266 |
| 72.5 | 664 | 40% | 398 | 228 |
| 67.5 | 854 | 30% | 384 | 220 |
| 62.5 | 927 | 20% | 278 | 159 |
| 57.5 | 600 | 10% | 90 | 51 |
| 52.5 | 610 | 10% | 92 | 52 |
| 47.5 | 611 | 20% | 183 | 105 |
| 42.5 | 656 | 30% | 295 | 169 |
| 37.5 | 1,023 | 40% | 614 | 351 |
| 32.5 | 734 | 50% | 551 | 315 |
| 27.5 | 334 | 60% | 301 | 172 |
| 22.5 | 252 | 70% | 265 | 151 |
| 17.5 | 125 | 80% | 150 | 86 |
| 12.5 | 47 | 85% | 60 | 34 |
| 7.5 | 22 | 90% | 30 | 17 |
| 2.5 | 13 | 100% | 20 | 11 |
| Total | | | 4,807 | 2,747 |

Yearly Savings 2,060 kWh
Cost Savings per unit \$306 /yr

City of Newark
 CHA #21823
 Building: 31 Green Street

ECM-4 Purchase More Efficient Heat Pump for Perimeter Offices

Notes

The cost listed is the difference in cost between an average efficiency heat pump and high efficiency heat pump

| Multipliers | |
|-------------|------|
| Material: | 0.98 |
| Labor: | 1.21 |
| Equipment: | 1.09 |

| Description | QTY | UNIT | UNIT COSTS | | | SUBTOTAL COSTS | | | TOTAL COST | REMARKS |
|---------------------------|-----|------|------------|-------|--------|----------------|-------|--------|------------|---------|
| | | | MAT. | LABOR | EQUIP. | MAT. | LABOR | EQUIP. | | |
| High Efficiency Heat pump | | | | | | \$ - | \$ - | \$ - | \$ - | |
| 12,000 BTU | 1 | EA | \$ 475 | | | \$ 466 | \$ - | \$ - | \$ 466 | |
| | | | | | | \$ - | \$ - | \$ - | \$ - | |
| | | | | | | \$ - | \$ - | \$ - | \$ - | |
| | | | | | | \$ - | \$ - | \$ - | \$ - | |
| | | | | | | \$ - | \$ - | \$ - | \$ - | |
| | | | | | | \$ - | \$ - | \$ - | \$ - | |
| | | | | | | \$ - | \$ - | \$ - | \$ - | |
| | | | | | | \$ - | \$ - | \$ - | \$ - | |
| | | | | | | \$ - | \$ - | \$ - | \$ - | |
| | | | | | | \$ - | \$ - | \$ - | \$ - | |
| | | | | | | \$ - | \$ - | \$ - | \$ - | |
| | | | | | | \$ - | \$ - | \$ - | \$ - | |

| | |
|---------------|-------------------|
| \$ 466 | Subtotal |
| \$ 47 | 10% Contingency |
| \$ - | 0% Contractor O&P |
| \$ - | 0% Engineering |
| \$ 512 | Total |

APPENDIX C

Equipment Inventory

City Hall Building

City of Newark BPU Energy Audit Program

920 Broad Street-City Hall

CHIA#21823

| Item Qty. | | Manuf | Model No. | Serial No. | Capacity | EER | Condition | Gas | MBH | Refrig. | Comments |
|---------------------|-----|--------------------|-----------------|------------|----------|-----|-----------|-----|-----|---------|-------------------------------|
| Cooling Tower | | | | | | | | | | | |
| | 1 | Baltimore Air Coil | na | | 100 Tons | | P | | | | |
| Pump | | | | | | | | | | | |
| | 2 | B&G | na | | 5 hp | | P | | | | condensate return pump |
| | 1 | na | na | | | | | | | | |
| Window Units | | | | | | | | | | | |
| | 118 | Carrier/Fedders | | | 12 MBTU | | G | | | | window air conditioning units |
| Air Handling Units. | | | | | | | | | | | |
| | 1 | Trane | TWE090B300CA | | 90 MBTU | | G | | | | |
| | 1 | Goodman | AH120-00 | | 120 MBTU | | G | | | | |
| | 1 | Trane | TWE120 | | 120 MBTU | | G | | | | |
| | 1 | Carrier | 40HH004 | | 36 MBTU | | G | | | | |
| | 1 | Trane | TWE090A100CA | | 90 MBTU | | G | | | | |
| | 1 | Trane | TWE048P13060 | | 48 MBTU | | G | | | | |
| | 1 | Carrier | Carrier | | NA | | G | | | | |
| | 1 | Carrier | 50BZN00851 | | 90 MBTU | | G | | | | |
| | 1 | Carrier | 40RR006320 | | 90 MBTU | | G | | | | |
| | 1 | Trane | TWE060P13080 | | 60 MBTU | | G | | | | |
| | 1 | Trane | TWE036P13081 | | 36 MBTU | | G | | | | |
| | 1 | Liebert Dalamate | DME027E-PH1 | | 24 MBTU | | G | | | | |
| | 1 | Liebert Dalamate | DME027E-PH1 | | 24 MBTU | | G | | | | |
| | 1 | Carrier | 40A003630080 | | 36 MBTU | | G | | | | |
| | 1 | Trane | TWE060D15080 | | 60 MBTU | | G | | | | |
| | 1 | Trane Odyssey | TWE90A300EL | | 90 MBTU | | G | | | | |
| | 1 | Trane | TWE048 | | 48 MBTU | | G | | | | |
| | 1 | Trane | 4TEC3F60B1000AA | | 120 MBTU | | G | | | | |
| | 1 | Westinghouse | AJ016CAW | | 48 MBTU | | G | | | | |
| | 1 | Trane SWUB | SWUB B506 | | 60 MBTU | | G | | | | |
| | 1 | Trane SWUB- | SWUB-C106-D | | 120 MBTU | | G | | | | |
| | 1 | Sanyo | KS2462R | | 24 MBTU | | G | | | | |
| | 1 | Sanyo | KS2462R | | 24 MBTU | | G | | | | |
| | 1 | Sanyo | KS3632 | | 33 MBTU | | G | | | | |
| | 1 | Sanyo | SKS2462R | | 24 MBTU | | G | | | | |
| | 1 | York FCU | KCBC-S128AB | | 120 MBTU | | G | | | | |
| | 1 | Carrier | 50AH048300 | | 48 MBTU | | G | | | | |
| | 1 | Trane | BWE036P13DA0 | | 36 MBTU | | G | | | | |
| | 1 | Amer. Standard | na | | 48 MBTU | | G | | | | |
| | 1 | Carrier | 40AQ024300BU | | 30 MBTU | | G | | | | |
| | 1 | Carrier | 40AQ020310 | | 60 MBTU | | G | | | | |
| | 1 | Carrier | 40HH006300 | | 18 MBTU | | G | | | | |
| | 1 | Trane | 2TEC3F18A1000AA | | 18 MBTU | | G | | | | |
| | 1 | Trane | 2TEC3F24V1000AA | | 24 MBTU | | G | | | | |
| | 1 | Sanyo | KS2462 | | 24 MBTU | | G | | | | |

CHA#21823

E = Excellent
G = Good
P = Poor

920 Broad St.

| Line# | Fir | Room Description | City Hall - | PQty | PWatts | Total Watts |
|-------|-----|----------------------|---|------|--------|-------------|
| 1.00 | e | exterior wall packs | 100 Wall Induction Wall Pack with PC | 10 | 105 | 1,050 |
| 2.00 | sb | sub-basement | 2L F32/28T8 EL HE IS-Norm Relamp/Reballast | 72 | 49 | 3,528 |
| 3.00 | sb | sub-basement | 1x8 4L F32/28T8 EL HE IS-Norm Wrap Pendant | 1 | 98 | 98 |
| 4.00 | sb | sub-basement-tv room | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 1 | 83 | 83 |
| 5.00 | sb | sub-basement | 1x8 4L F32/28T8 EL HE IS-Norm Wrap Pendant | 1 | 98 | 98 |
| 6.00 | | 112 | 3L F32/28T8 EL HE IS-NORM RELAMP/REBALLAST | 33 | 72 | 2,376 |
| 7.00 | | 112 | 1L Compact Fluorescent 23 Spiral Relamp | 4 | 23 | 92 |
| 8.00 | | 112 | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 18 | 83 | 1,494 |
| 9.00 | | 111 | 1x4 2L F32T8 EL HE IS-Norm Indirect Suspended | 22 | 55 | 1,210 |
| 10.00 | | Ladies Room | 1x8 4L F32/28T8 EL HE IS-Norm Wrap Pendant | 1 | 98 | 98 |
| 11.00 | | Ladies Room | 1x4 2L F32/28T8 EL HE IS-Norm Wrap Pendant | 1 | 49 | 49 |
| 12.00 | | | 3L F32/28T8 EL HE IS-NORM RELAMP/REBALLAST | 16 | 72 | 1,152 |
| 13.00 | | 109 | 1x4 2L F32T8 EL HE IS-Norm Indirect Suspended | 32 | 55 | 1,760 |
| 14.00 | | 106 | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 20 | 83 | 1,660 |
| 15.00 | | 104 | 3L F32/28T8 EL HE IS-NORM RELAMP/REBALLAST | 47 | 72 | 3,384 |
| 16.00 | | 104 conference room | 1L Compact Fluorescent 23 Spiral Relamp | 10 | 23 | 230 |
| 17.00 | | 104 Credit Union | 3L F32/28T8 EL HE IS-NORM RELAMP/REBALLAST | 47 | 72 | 3,384 |
| 18.00 | | 101 | 2L F32/28T8 EL HE IS-Norm Relamp/Reballast | 33 | 49 | 1,617 |
| 19.00 | | 101 | 2L F32/28T8 EL HE IS-Norm Relamp/Reballast | 38 | 49 | 1,862 |
| 20.00 | | 117 | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 48 | 83 | 3,984 |
| 21.00 | | 117 | 1x4 2L F32/28T8 EL HE IS-Norm Wrap Pendant | 2 | 49 | 98 |
| 22.00 | | 115 Police? | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 22 | 83 | 1,826 |
| 23.00 | | 115 Bathroom | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 1 | 83 | 83 |
| 24.00 | | 115 safe | 1L Compact Fluorescent 23 Spiral Relamp | 3 | 23 | 69 |
| 25.00 | | 115 Locked Area | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 3 | 83 | 249 |
| 26.00 | | B1 | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 23 | 83 | 1,909 |
| 27.00 | | B1 | 1x4 2L F32/28T8 EL HE IS-Norm Wrap Pendant | 2 | 49 | 98 |
| 28.00 | | B1 | 1x8 4L F32/28T8 EL HE IS-Norm Wrap Pendant | 2 | 98 | 196 |
| 29.00 | | B1 COPY CENTER | 1x8 4L F32/28T8 EL HE IS-Norm Wrap Pendant | 4 | 98 | 392 |
| 30.00 | | B1 Bathroom | 1x8 4L F32/28T8 EL HE IS-Norm Wrap Pendant | 1 | 98 | 98 |
| 31.00 | | B4 | 1x8 4L F32/28T8 EL HE IS-Norm Wrap Pendant | 5 | 98 | 490 |
| 32.00 | | B3 | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 9 | 83 | 747 |
| 33.00 | | B5A | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 9 | 83 | 747 |
| 34.00 | | B9 & B9A | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 11 | 83 | 913 |
| 35.00 | | B12 | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 4 | 83 | 332 |
| 36.00 | | B12 | 1x4 2L F32T8 EL HE IS-Norm Indirect Suspended | 4 | 55 | 220 |
| 37.00 | | B 13 & Bathroom | 1L Compact Fluorescent 23 Spiral Relamp | 4 | 23 | 92 |
| 38.00 | | B 13 & Bathroom | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 22 | 83 | 1,826 |
| 39.00 | | B 13 & Bathroom | 1x8 4L F32/28T8 EL HE IS-Norm Wrap Pendant | 1 | 98 | 98 |
| 40.00 | | B16 | 1x8 4L F32/28T8 EL HE IS-Norm Wrap Pendant | 6 | 98 | 588 |
| 41.00 | | B23 | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 6 | 83 | 498 |
| 42.00 | | B23 | 1x4 2L F32/28T8 EL HE IS-Norm Wrap Pendant | 34 | 49 | 1,666 |
| 43.00 | | B Mens Room | 1x8 4L F32/28T8 EL HE IS-Norm Wrap Pendant | 1 | 98 | 98 |
| 44.00 | | B Mens Room | 1x4 2L F32/28T8 EL HE IS-Norm Wrap Pendant | 1 | 49 | 49 |
| 45.00 | | B28 | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 2 | 83 | 166 |
| 46.00 | | B28 | 1x4 2L F32/28T8 EL HE IS-Norm Wrap Pendant | 2 | 49 | 98 |
| 47.00 | | B25 | 1x8 4L F32/28T8 EL HE IS-Norm Wrap Pendant | 2 | 98 | 196 |
| 48.00 | | B25 | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 6 | 83 | 498 |
| 49.00 | | B25 Bathroom | 1L Compact Fluorescent 23 Spiral Relamp | 1 | 23 | 23 |
| 50.00 | | B26 | 1x8 4L F32/28T8 EL HE IS-Norm Wrap Pendant | 10 | 98 | 980 |
| 51.00 | | B26 | 1x8 4L F32/28T8 EL HE IS-Norm Wrap Pendant | 2 | 98 | 196 |
| 52.00 | | B27 Lunchroom | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 15 | 83 | 1,245 |
| 53.00 | | B27 Lunchroom | 2x2 3L F17T8 EL HE IS-Norm Troffer Parabolic | 6 | 46 | 276 |
| 54.00 | | B 17 Main | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 25 | 83 | 2,075 |

| | | | | | |
|--------|-------------------------|---|----|----|-------|
| 55.00 | B28 | 1x8 4L F32/28T8 EL HE IS-Norm Wrap Pendant | 2 | 98 | 196 |
| 56.00 | B Level Ladies | 1x8 4L F32/28T8 EL HE IS-Norm Wrap Pendant | 1 | 98 | 98 |
| 57.00 | B Level Ladies | 1x4 2L F32/28T8 EL HE IS-Norm Wrap Pendant | 1 | 49 | 49 |
| 58.00 | B29 | 1x8 4L F32/28T8 EL HE IS-Norm Wrap Pendant | 16 | 98 | 1,568 |
| 59.00 | B31 A Hallway | 3L F32/28T8 EL HE IS-NORM RELAMP/REBALLAST | 7 | 72 | 504 |
| 60.00 | B 31 A | 3L F32/28T8 EL HE IS-NORM RELAMP/REBALLAST | 4 | 72 | 288 |
| 61.00 | B 31 B | 3L F32/28T8 EL HE IS-NORM RELAMP/REBALLAST | 8 | 72 | 576 |
| 62.00 | B 31 F | 3L F32/28T8 EL HE IS-NORM RELAMP/REBALLAST | 8 | 72 | 576 |
| 63.00 | B 31 F | 1x4 2L F32T8 EL HE IS-Norm Indirect Suspended | 4 | 55 | 220 |
| 64.00 | B31D | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 8 | 83 | 664 |
| 65.00 | B 31D | 3L F32/28T8 EL HE IS-NORM RELAMP/REBALLAST | 3 | 72 | 216 |
| 66.00 | B 31 Bathroom | 2x2 3L F17T8 EL HE IS-Norm Troffer Parabolic | 1 | 46 | 46 |
| 67.00 | 305 | 2x2 3L F17T8 EL HE IS-Norm Troffer Parabolic | 14 | 46 | 644 |
| 68.00 | 306 | 2x2 3L F17T8 EL HE IS-Norm Troffer Parabolic | 13 | 46 | 598 |
| 69.00 | 306 entrance | 4L F32/28T8 EL HE IS-Norm Relamp/Reballast | 1 | 98 | 98 |
| 70.00 | 309 ladies Room | 2x2 3L F17T8 EL HE IS-Norm Troffer Parabolic | 4 | 46 | 184 |
| 71.00 | 3rd Mens | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 4 | 83 | 332 |
| 72.00 | 313 | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 9 | 83 | 747 |
| 73.00 | 216 | 1x8 4L F32/28T8 EL HE IS-Norm Wrap Pendant | 4 | 98 | 392 |
| 74.00 | 216 | 1x4 2L F32/28T8 EL HE IS-Norm Wrap Pendant | 4 | 49 | 196 |
| 75.00 | Mens Room 3rd | 1x8 4L F32/28T8 EL HE IS-Norm Wrap Pendant | 1 | 98 | 98 |
| 76.00 | Mens Room 3rd | 2L F32/28T8 EL HE IS-Norm Relamp/Reballast | 1 | 49 | 49 |
| 77.00 | 218 | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 30 | 83 | 2,490 |
| 78.00 | 218 Ladies Room | 2L F32/28T8 EL HE IS-Norm Relamp/Reballast | 1 | 49 | 49 |
| 79.00 | 218 Chelsea Albucher | 2X4 3L F32T8 HIS-N Indirect Recessed Grid | 4 | 82 | 328 |
| 80.00 | 220 | 1x4 2L F32T8 EL HE IS-Norm Indirect Suspended | 6 | 55 | 330 |
| 81.00 | 221 & Conference | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 6 | 83 | 498 |
| 82.00 | 222 | 1x8 4L F32/28T8 EL HE IS-Norm Wrap Pendant | 3 | 98 | 294 |
| 83.00 | Cory Booker Area 200 | 1L Compact Fluorescent 23 Spiral Relamp | 6 | 23 | 138 |
| 84.00 | 200 Conf Room | 1L Compact Fluorescent 23 Spiral Relamp | 6 | 23 | 138 |
| 85.00 | 200 Offices | 1x8 4L F32/28T8 EL HE IS-Norm Wrap Pendant | 7 | 98 | 686 |
| 86.00 | 200 Bathroom | 1L Compact Fluorescent 23 Spiral Relamp | 1 | 23 | 23 |
| 87.00 | 200 dep Chief of Staff | 1x8 4L F32/28T8 EL HE IS-Norm Wrap Pendant | 1 | 98 | 98 |
| 88.00 | Bari Matke | 1x4 2L F32/28T8 EL HE IS-Norm Wrap Pendant | 4 | 49 | 196 |
| 89.00 | Cory Booker Area 200 | 1L Compact Fluorescent 23 Spiral Relamp | 15 | 23 | 345 |
| 90.00 | Cory Booker Conf Room | 1L Compact Fluorescent 23 Spiral Relamp | 3 | 23 | 69 |
| 91.00 | Cory Booker Conf Room | 2X4 3L F32T8 HIS-N Indirect Recessed Grid | 6 | 82 | 492 |
| 92.00 | Chandelier | 1L CCFL 8 W Flame Clear Candel Relamp | 50 | 8 | 400 |
| 93.00 | Cory Booker Back Office | 2X4 3L F32T8 HIS-N Indirect Recessed Grid | 6 | 82 | 492 |
| 94.00 | Cory Booker Office | 2X4 3L F32T8 HIS-N Indirect Recessed Grid | 12 | 82 | 984 |
| 95.00 | B31 A | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 3 | 83 | 249 |
| 96.00 | Cory Booker Area | 1x8 4L F32/28T8 EL HE IS-Norm Wrap Pendant | 2 | 98 | 196 |
| 97.00 | 204 & Back Office | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 12 | 83 | 996 |
| 98.00 | 204 bathroom | 1L Compact Fluorescent 23 Spiral Relamp | 1 | 23 | 23 |
| 99.00 | 205 & Conf Room | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 12 | 83 | 996 |
| 100.00 | 205 & Conf Room | 2x2 3L F17T8 EL HE IS-Norm Troffer Parabolic | 13 | 46 | 598 |
| 101.00 | 207 | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 15 | 83 | 1,245 |
| 102.00 | 207 | 1x4 2L F32T8 EL HE IS-Norm Indirect Suspended | 4 | 55 | 220 |
| 103.00 | 210 | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 8 | 83 | 664 |
| 104.00 | 211 | 1x4 2L F32T8 EL HE IS-Norm Indirect Suspended | 2 | 55 | 110 |
| 105.00 | 211 | 1x4 2L F32T8 EL HE IS-Norm Indirect Suspended | 8 | 55 | 440 |
| 106.00 | 212 A | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 6 | 83 | 498 |
| 107.00 | 212 A | 1x4 2L F32T8 EL HE IS-Norm Indirect Suspended | 2 | 55 | 110 |
| 108.00 | 212 A | 1L Compact Fluorescent 23 Spiral Relamp | 2 | 23 | 46 |
| 109.00 | 212 A | 1L Compact Fluorescent 23 Spiral Relamp | 6 | 23 | 138 |

| | | | | | |
|--------|--------------------------|---|----|----|-------|
| 110.00 | 212 A | 1x4 2L F32/28T8 EL HE IS-Norm Wrap Pendant | 1 | 49 | 49 |
| 111.00 | 209 | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 13 | 83 | 1,079 |
| 112.00 | 209 | 1L Compact Fluorescent 23 Spiral Relamp | 11 | 23 | 253 |
| 113.00 | 209 | 1x4 2L F32/28T8 EL HE IS-Norm Wrap Pendant | 4 | 49 | 196 |
| 114.00 | 209 Ooutside Bathroom | 1L Compact Fluorescent 23 Spiral Relamp | 2 | 23 | 46 |
| 115.00 | 214 & 214 A | 1x4 2L F32T8 EL HE IS-Norm Indirect Suspended | 12 | 55 | 660 |
| 116.00 | 215 (all 100w) | 1L Compact Fluorescent 23 Spiral Relamp | 45 | 23 | 1,035 |
| 117.00 | 216 | 1x4 2L F32T8 EL HE IS-Norm Indirect Suspended | 8 | 55 | 440 |
| 118.00 | 216 | 1x4 2L F32/28T8 EL HE IS-Norm Wrap Pendant | 4 | 49 | 196 |
| 119.00 | 113 | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 18 | 83 | 1,494 |
| 120.00 | Outside 113 | 2x2 3L F17T8 EL HE IS-Norm Troffer Parabolic | 1 | 46 | 46 |
| 121.00 | 113 Hallway | 1x4 2L F32/28T8 EL HE IS-Norm Wrap Pendant | 8 | 49 | 392 |
| 122.00 | 109 | 1x4 2L F32T8 EL HE IS-Norm Indirect Suspended | 22 | 55 | 1,210 |
| 123.00 | 109 | 1x4 2L F32/28T8 EL HE IS-Norm Wrap Pendant | 2 | 49 | 98 |
| 124.00 | 109 | 1x4 2L F32/28T8 EL HE IS-Norm Wrap Pendant | 4 | 49 | 196 |
| 125.00 | 109 Chris darby | 1x4 2L F32T8 EL HE IS-Norm Indirect Suspended | 4 | 55 | 220 |
| 126.00 | 109 Also | 1x4 2L F32/28T8 EL HE IS-Norm Wrap Pendant | 7 | 49 | 343 |
| 127.00 | 109 back hallway | 1x8 4L F32/28T8 EL HE IS-Norm Wrap Pendant | 3 | 98 | 294 |
| 128.00 | 104 | 1x8 4L F32/28T8 EL HE IS-Norm Wrap Pendant | 1 | 98 | 98 |
| 129.00 | 101 | 1L Compact Fluorescent 23 Spiral Relamp | 10 | 23 | 230 |
| 130.00 | 402 | 1x8 4L F32/28T8 EL HE IS-Norm Wrap Pendant | 2 | 98 | 196 |
| 131.00 | 402 | 1x8 4L F32/28T8 EL HE IS-Norm Wrap Pendant | 4 | 98 | 392 |
| 132.00 | 402 | 1L Compact Fluorescent 23 Spiral Relamp | 5 | 23 | 115 |
| 133.00 | 402 | 1x8 4L F32/28T8 EL HE IS-Norm Wrap Pendant | 7 | 98 | 686 |
| 134.00 | 402 | 2L F32/28T8 EL HE IS-Norm Relamp/Reballast | 4 | 49 | 196 |
| 135.00 | 403 | 1x8 4L F32/28T8 EL HE IS-Norm Wrap Pendant | 6 | 98 | 588 |
| 136.00 | 402/403 conf Room | 1x8 4L F32/28T8 EL HE IS-Norm Wrap Pendant | 1 | 98 | 98 |
| 137.00 | 406/407 | 1x8 4L F32/28T8 EL HE IS-Norm Wrap Pendant | 19 | 98 | 1,862 |
| 138.00 | 406/407 | 1x4 2L F32/28T8 EL HE IS-Norm Wrap Pendant | 2 | 49 | 98 |
| 139.00 | 409/412 | 1x8 4L F32/28T8 EL HE IS-Norm Wrap Pendant | 1 | 98 | 98 |
| 140.00 | 409/412 | 1x4 2L F32T8 EL HE IS-Norm Indirect Suspended | 26 | 55 | 1,430 |
| 141.00 | 415A | 4L F32/28T8 EL HE IS-Norm Relamp/Reballast | 40 | 98 | 3,920 |
| 142.00 | 415 | 4L F32/28T8 EL HE IS-Norm Relamp/Reballast | 28 | 98 | 2,744 |
| 143.00 | Mens Room 4th | 4L F32/28T8 EL HE IS-Norm Relamp/Reballast | 4 | 98 | 392 |
| 144.00 | Ladies Room 4th | 4L F32/28T8 EL HE IS-Norm Relamp/Reballast | 6 | 98 | 588 |
| 145.00 | 416 | 1x8 4L F32/28T8 EL HE IS-Norm Wrap Pendant | 4 | 98 | 392 |
| 146.00 | 416 | 1x4 2L F32/28T8 EL HE IS-Norm Wrap Pendant | 16 | 49 | 784 |
| 147.00 | 416 | 2x2 3L F17T8 EL HE IS-Norm Troffer Parabolic | 2 | 46 | 92 |
| 148.00 | 419 | 1x8 4L F32/28T8 EL HE IS-Norm Wrap Pendant | 3 | 98 | 294 |
| 149.00 | 419 | 1x4 2L F32T8 EL HE IS-Norm Indirect Suspended | 12 | 55 | 660 |
| 150.00 | 421 | 3L F32/28T8 EL HE IS-NORM RELAMP/REBALLAST | 34 | 72 | 2,448 |
| 151.00 | 315 | 1x4 2L F32/28T8 EL HE IS-Norm Wrap Pendant | 8 | 49 | 392 |
| 152.00 | 3rd ladies | 2L F32/28T8 EL HE IS-Norm Relamp/Reballast | 2 | 49 | 98 |
| 153.00 | 3 rd ladies | 1x8 4L F32/28T8 EL HE IS-Norm Wrap Pendant | 1 | 98 | 98 |
| 154.00 | 316 | 1x8 4L F32/28T8 EL HE IS-Norm Wrap Pendant | 8 | 98 | 784 |
| 155.00 | 316 | 1L Compact Fluorescent 23 Spiral Relamp | 9 | 23 | 207 |
| 156.00 | 316 | 1x4 2L F32/28T8 EL HE IS-Norm Wrap Pendant | 25 | 49 | 1,225 |
| 157.00 | 316 | 1x4 2L F32T8 EL HE IS-Norm Indirect Suspended | 26 | 55 | 1,430 |
| 158.00 | 316 Storeroom | 1x4 2L F32/28T8 EL HE IS-Norm Wrap Pendant | 1 | 49 | 49 |
| 159.00 | 316 Bathroom | 2L F32/28T8 EL HE IS-Norm Relamp/Reballast | 1 | 49 | 49 |
| 160.00 | 316 Copy Room | 1x4 2L F32T8 EL HE IS-Norm Indirect Suspended | 2 | 55 | 110 |
| 161.00 | 304 up to grey conf room | 4L F32/28T8 EL HE IS-Norm Relamp/Reballast | 26 | 98 | 2,548 |
| 162.00 | 304 offices | 1x4 2L F32T8 EL HE IS-Norm Indirect Suspended | 18 | 55 | 990 |
| 163.00 | 306 | 4L F32/28T8 EL HE IS-Norm Relamp/Reballast | 10 | 98 | 980 |
| 164.00 | 306 | 1L Compact Fluorescent 23 Spiral Relamp | 8 | 23 | 184 |

| | | | | | |
|--------|---------------|---|----|----|-------|
| 165.00 | 306 File Room | 1L Compact Fluorescent 23 Spiral Relamp | 8 | 23 | 184 |
| 166.00 | 309 | 4L F32/28T8 EL HE IS-Norm Relamp/Reballast | 16 | 98 | 1,568 |
| 167.00 | 309 copier | 4L F32/28T8 EL HE IS-Norm Relamp/Reballast | 3 | 98 | 294 |
| 168.00 | 311 | 4L F32/28T8 EL HE IS-Norm Relamp/Reballast | 14 | 98 | 1,372 |
| 169.00 | 312 | 4L F32/28T8 EL HE IS-Norm Relamp/Reballast | 2 | 98 | 196 |
| 170.00 | 312 offices | 1x4 2L F32T8 EL HE IS-Norm Indirect Suspended | 16 | 55 | 880 |

Police Building

City of Newark BPU Energy Audit Program

22 Franklin Street
CHA#21823

| Item | Qty. | Manuf | Model No. | Serial No. | Capacity | EER | Condition | Gas | MBH | Refrig. | Comments |
|----------------------------------|------|-------------------|------------------------------|------------|----------|-----|-----------|-----|-----|---------|--|
| Air Handling Units. | | | | | | | | | | | |
| | 2 | | | | 5 ton | | G | | | | Business Office |
| | 1 | | | | 10 ton | | P | | | | Records Room |
| | 1 | Carrier | | | 5 ton | | P | | | | Front Vestibule |
| | 1 | | | | 7.5 ton | | G | | | | ID Files Room |
| | 1 | Carrier | 50 TM-006 | | 5 ton | | G | | | | 4th fir Major Crimes Unit |
| | 1 | Carrier | Weathermaker | | 5 ton | | P | | | | 4th fir Major Crimes Unit |
| | 1 | | | | 10 ton | | P | | | | 4th fir Homicide |
| | 1 | Carrier | 40CB0600300 | | 5 ton | | G | | | | 3rd Floor Criminal Investigations |
| | 1 | | | | 5 ton | | P | | | | 3rd Floor |
| | 1 | Trane | TWE120A300EI | | 10 ton | | G | | | | 3rd Floor Auto |
| | 1 | American Standard | TWE090A300EL | | | | E | | | | 2nd floor Special Victims |
| | 2 | American Standard | TWE090A300EL | | | | E | | | | serves records Room, but located in basement |
| | 1 | | MCCAO14GAJOAB | | | | E | | | | |
| Condensing Units | | | | | | | | | | | |
| | 1 | Allegence 10 | 2A7C060A3000 | | 5 ton | | G | | | | |
| | 1 | | 38CKC060370 | | | | G | | | | |
| | 1 | | 2A7B0060A1000AA | | 5 ton | | G | | | | |
| | 1 | Allegence 10 | 4A7A3030A1000AA | | | | G | | | | rear of building |
| | 1 | Trane | CTA120B100AA | | | | G | | | | rear of building |
| | 1 | Trane | CTA120B100AA | | | | G | | | | rear of building |
| | 1 | Trane | TTA090D300AA | | | | G | | | | rear of building |
| | 1 | American Standard | | | 5 tons | | G | | | | rear of building |
| | 1 | Trane | TT180B300FA | | | | G | | | | |
| Domestic Hot Water Heater | | | | | | | | | | | |
| | 3 | GE | point of use electric heater | | | | G | | | | |
| Exhaust Fans | | | | | | | | | | | |
| | 1 | Toilet exhaust | | | | | G | | | | limited operation. |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

E = Excellent
G = Good
P = Poor

22 Franklin St.

| Line# | Fir | Room Description | Police | PQty | PWatts | Total Watts |
|-------|-----|--|--|------|--------|-------------|
| 1.00 | E | Exterior Police Side | 100 Wall Induction Wall Pack with PC | 5 | 105 | 525 |
| 2.00 | E | Court Exterior | 100 Wall Induction Wall Pack with PC | 4 | 105 | 420 |
| 3.00 | E | Prisoner Entrance & Police Parking Lot | Induction 200 Flood Photo Cell | 6 | 220 | 1,320 |
| 4.00 | B | Cell Block Captains Office | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 16 | 83 | 1,328 |
| 5.00 | B | Hallway | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 16 | 83 | 1,328 |
| 6.00 | B | Bathroom | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 1 | 83 | 83 |
| 7.00 | B | Records Mgt. Storage | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 19 | 83 | 1,577 |
| 8.00 | C | Court 20 | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 5 | 83 | 415 |
| 9.00 | C | Court 20 | 2x2 3L F17T8 EL HE IS-Norm Troffer Parabolic | 8 | 46 | 368 |
| 10.00 | C | Court 20 | 6L F32T8 HIS-N RLRB | 12 | 165 | 1,980 |
| 11.00 | C | Court 20 | EXIT LED2 | 2 | 2 | 4 |
| 12.00 | C | Court 20 | 1L Compact Fluorescent 23 Spiral Relamp | 3 | 23 | 69 |
| 13.00 | C | Court 6 | 6L F32T8 HIS-N RLRB | 20 | 165 | 3,300 |
| 14.00 | C | Court 6 | EXIT LED2 | 1 | 2 | 2 |
| 15.00 | C | Court 3 | 2x2 3L F17T8 EL HE IS-Norm Troffer Parabolic | 7 | 46 | 322 |
| 16.00 | C | Court 3 | 6L F32T8 HIS-N RLRB | 9 | 165 | 1,485 |
| 17.00 | C | Court 3 | EXIT LED2 | 2 | 2 | 4 |
| 18.00 | C | Court 3 Chambers | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 3 | 83 | 249 |
| 19.00 | C | Court 3 Chambers | 2x2 3L F17T8 EL HE IS-Norm Troffer Parabolic | 2 | 46 | 92 |
| 20.00 | C | Court 1 | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 4 | 83 | 332 |
| 21.00 | C | Court 1 | 6L F32T8 HIS-N RLRB | 5 | 165 | 825 |
| 22.00 | C | Court 1 | EXIT LED2 | 2 | 2 | 4 |
| 23.00 | C | Court 5 | 2x2 3L F17T8 EL HE IS-Norm Troffer Parabolic | 1 | 46 | 46 |
| 24.00 | C | Court 5 | 1x8 4L F32/28T8 EL HE IS-Norm Wrap Surface | 2 | 98 | 196 |
| 25.00 | C | Court 5 | 4L F17T8 EL HE IS-Norm Relamp/Reballast | 1 | 61 | 61 |
| 26.00 | C | Court 5 | EXIT LED2 | 1 | 2 | 2 |
| 27.00 | C | Court 5 | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 30 | 83 | 2,490 |
| 28.00 | C | Court 7 | 1L Compact Fluorescent 23 Spiral Relamp | 2 | 23 | 46 |
| 29.00 | C | Court 7 | 1x8 4L F32/28T8 EL HE IS-Norm Wrap Pendant | 4 | 98 | 392 |
| 30.00 | C | Court 7 | 1x8 4L F32/28T8 EL HE IS-Norm Wrap Pendant | 12 | 98 | 1,176 |
| 31.00 | C | Court 7 | 1x4 2L F32/28T8 EL HE IS-Norm Wrap Pendant | 5 | 49 | 245 |
| 32.00 | J | Jail: hallway | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 30 | 83 | 2,490 |
| 33.00 | J | Check In Area | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 5 | 83 | 415 |
| 34.00 | J | Check In Area | 2x2 3L F17T8 EL HE IS-Norm Troffer Parabolic | 1 | 46 | 46 |
| 35.00 | J | Check In Area | 2L F32T8 EL HE IS-Norm Relamp/Reballast | 1 | 55 | 55 |
| 36.00 | J | D83-1 | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 2 | 83 | 166 |
| 37.00 | J | D84 | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 1 | 83 | 83 |
| 38.00 | J | D87 | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 3 | 83 | 249 |
| 39.00 | J | Female Sect | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 2 | 83 | 166 |
| 40.00 | J | Female Sect | 2x2 3L F17T8 EL HE IS-Norm Troffer Parabolic | 1 | 46 | 46 |
| 41.00 | J | Hallway | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 3 | 83 | 249 |
| 42.00 | J | Cellblocks | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 4 | 83 | 332 |
| 43.00 | J | Cellblocks | 2L F32/28T8 EL HE IS-Norm Relamp/Reballast | 8 | 49 | 392 |
| 44.00 | J | Gym | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 7 | 83 | 581 |
| 45.00 | J | TV Room | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 16 | 83 | 1,328 |
| 46.00 | J | TV Room | 2L F32/28T8 EL HE IS-Norm Relamp/Reballast | 1 | 49 | 49 |
| 47.00 | J | Cells | 2L F32/28T8 EL HE IS-Norm Relamp/Reballast | 50 | 49 | 2,450 |
| 48.00 | J | Print Room | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 4 | 83 | 332 |
| 49.00 | J | Garage | Induction 150 Canopy Gas Light | 8 | 165 | 1,320 |
| 50.00 | J | Processing | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 26 | 83 | 2,158 |
| 51.00 | J | Processing | 2L F32T8 EL HE IS-Norm Relamp/Reballast | 2 | 55 | 110 |
| 52.00 | I | Main Lobby | 100 Wall Induction Wall Pack with PC | 2 | 105 | 210 |
| 53.00 | I | Stairwells at end of both hallways | 1x4 2L F32T8 EL HE IS-Norm Decorative | 26 | 55 | 1,430 |
| 54.00 | I | 105 | 6L F32T8 HIS-N RLRB | 12 | 165 | 1,980 |
| 55.00 | I | 105 | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 4 | 83 | 332 |
| 56.00 | I | 105 | 1L Compact Fluorescent 23 Spiral Relamp | 8 | 23 | 184 |
| 57.00 | I | Janitor Room | 1L Compact Fluorescent 23 Spiral Relamp | 2 | 23 | 46 |
| 58.00 | I | Hallway | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 24 | 83 | 1,992 |

| | | | | | | |
|--------|---|--------------------------------|---|----|----|-------|
| 59.00 | 1 | Hallway | EXIT LED2 | 4 | 2 | 8 |
| 60.00 | 1 | EVAC Team | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 3 | 83 | 249 |
| 61.00 | 1 | EVAC Team | 2x2 3L F17T8 EL HE IS-Norm Troffer Parabolic | 5 | 46 | 230 |
| 62.00 | 1 | Violations Bureau | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 62 | 83 | 5,146 |
| 63.00 | 1 | Violations Bureau | 2x2 3L F17T8 EL HE IS-Norm Troffer Parabolic | 4 | 46 | 184 |
| 64.00 | 1 | Violations Bureau-Bathrooms | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 3 | 83 | 249 |
| 65.00 | 1 | File Storage next to 105 | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 7 | 83 | 581 |
| 66.00 | 1 | Hall bathroom | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 2 | 83 | 166 |
| 67.00 | 1 | Main Lobby | 1L Compact Fluorescent 23 Spiral Relamp | 8 | 23 | 184 |
| 68.00 | 1 | Main Stairwell Marble Steps Up | 1x4 2L F32T8 EL HE IS-Norm Decorative | 20 | 55 | 1,100 |
| 69.00 | 1 | Main Stairwell Marble Steps Up | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 2 | 83 | 166 |
| 70.00 | 1 | Main Stairwell Marble Steps Up | EXIT LED2 | 1 | 2 | 2 |
| 71.00 | 2 | Main Area | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 18 | 83 | 1,494 |
| 72.00 | 2 | 210 Btg Room | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 58 | 83 | 4,814 |
| 73.00 | 2 | 210 File Room 1 & 2 | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 12 | 83 | 996 |
| 74.00 | 2 | 210 Court Directors Office | 2X4 3L F32T8 HIS-N Indirect Recessed Grid | 6 | 82 | 492 |
| 75.00 | 2 | 210 Ms O'Casio Office | 2X4 3L F32T8 HIS-N Indirect Recessed Grid | 4 | 82 | 328 |
| 76.00 | 2 | Janitors Closet | 1L Compact Fluorescent 23 Spiral Relamp | 1 | 23 | 23 |
| 77.00 | 2 | Room 200 data Processing | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 29 | 83 | 2,407 |
| 78.00 | 2 | 2nd Floor Hallways | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 31 | 83 | 2,573 |
| 79.00 | 2 | 2nd Floor Hallways | EXIT LED2 | 4 | 2 | 8 |
| 80.00 | 2 | 2nd Floor Holding Area | 1x4 2L F32T8 EL HE IS-Norm Decorative | 4 | 55 | 220 |
| 81.00 | 2 | 2nd Floor Holding Area | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 11 | 83 | 913 |
| 82.00 | 2 | 2nd Floor Holding Area | EXIT LED2 | 2 | 2 | 4 |
| 83.00 | 2 | 207 | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 8 | 83 | 664 |
| 84.00 | 2 | 207 | 2x2 3L F17T8 EL HE IS-Norm Troffer Parabolic | 3 | 46 | 138 |
| 85.00 | 3 | 3rd Floor Hallway | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 16 | 83 | 1,328 |
| 86.00 | 3 | 3rd Floor Hallway | EXIT LED2 | 4 | 2 | 8 |
| 87.00 | 3 | 313 | 2L F32T8 EL HE IS-Norm Relamp/Reballast | 1 | 55 | 55 |
| 88.00 | 3 | 313 | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 41 | 83 | 3,403 |
| 89.00 | 3 | 312 | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 18 | 83 | 1,494 |
| 90.00 | 3 | 312 | 2x2 3L F17T8 EL HE IS-Norm Troffer Parabolic | 1 | 46 | 46 |
| 91.00 | 3 | 308 | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 16 | 83 | 1,328 |
| 92.00 | 3 | Time Clock | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 2 | 83 | 166 |
| 93.00 | 3 | 309 | 1x4 2L F32T8 EL HE IS-Norm Indirect Suspended | 8 | 55 | 440 |
| 94.00 | 3 | 309 Offices | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 29 | 83 | 2,407 |
| 95.00 | 3 | 309 Offices | 1L Compact Fluorescent 23 Spiral Relamp | 2 | 23 | 46 |
| 96.00 | 3 | 309 Conf Room | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 8 | 83 | 664 |
| 97.00 | 3 | 309 Conf Room | 1L Compact Fluorescent 23 Spiral Relamp | 1 | 23 | 23 |
| 98.00 | 3 | 309 Main Area | 1x4 2L F32T8 EL HE IS-Norm Indirect Suspended | 2 | 55 | 110 |
| 99.00 | 3 | 309 Main Area | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 12 | 83 | 996 |
| 100.00 | 3 | 309 Nunes | 1x4 2L F32T8 EL HE IS-Norm Indirect Suspended | 2 | 55 | 110 |
| 101.00 | 3 | Judge Nunes Office | 1x4 2L F32T8 EL HE IS-Norm Indirect Suspended | 8 | 55 | 440 |
| 102.00 | 3 | 337 | 1x4 2L F32T8 EL HE IS-Norm Indirect Suspended | 4 | 55 | 220 |
| 103.00 | 3 | 337 | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 10 | 83 | 830 |
| 104.00 | 3 | KO's Space | 1x4 2L F32/28T8 EL HE IS-Norm Wrap Pendant | 5 | 49 | 245 |
| 105.00 | 3 | KO's Space | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 1 | 83 | 83 |
| 106.00 | 4 | 4th Floor Hallway | 1x4 2L F32T8 EL HE IS-Norm Indirect Suspended | 8 | 55 | 440 |
| 107.00 | 4 | 4th Floor Hallway | 2x2 3L F17T8 EL HE IS-Norm Troffer Parabolic | 20 | 46 | 920 |
| 108.00 | 4 | Janitors Closet | 1L Compact Fluorescent 23 Spiral Relamp | 1 | 23 | 23 |
| 109.00 | 4 | Compstat Unit | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 10 | 83 | 830 |
| 110.00 | 4 | Offie of Administration | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 2 | 83 | 166 |
| 111.00 | 4 | Deputy Chief | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 3 | 83 | 249 |
| 112.00 | 4 | HR | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 8 | 83 | 664 |
| 113.00 | 4 | Firearms Section | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 2 | 83 | 166 |
| 114.00 | 4 | Compstat Unit #2 Area (Maps) | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 2 | 83 | 166 |
| 115.00 | 4 | Policy & Planning | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 7 | 83 | 581 |
| 116.00 | 4 | License Unit | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 9 | 83 | 747 |
| 117.00 | 4 | Bathroom 1 | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 1 | 83 | 83 |
| 118.00 | 4 | Bathroom 2 | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 1 | 83 | 83 |



| | | | | | | |
|---------|---|---------------------------|--|----|----|-------|
| | 4 | bathroom 2 | 2x2 3L F17T8 EL HE IS-Norm Troffer Parabolic | 1 | 46 | 46 |
| 120.004 | | Bathroom 3 | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 1 | 83 | 83 |
| 121.004 | | Command & Control | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 2 | 83 | 166 |
| 122.004 | | Complaint Section | 2x2 3L F17T8 EL HE IS-Norm Troffer Parabolic | 4 | 46 | 184 |
| 123.004 | | Complaint Section | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 36 | 83 | 2,988 |
| 124.004 | | 4th ladies | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 2 | 83 | 166 |
| 125.004 | | File | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 1 | 83 | 83 |
| 126.004 | | hallway | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 8 | 83 | 664 |
| 127.004 | | Mens | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 1 | 83 | 83 |
| 128.004 | | Mens | 2x2 3L F17T8 EL HE IS-Norm Troffer Parabolic | 2 | 46 | 92 |
| 129.004 | | Conference room | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 6 | 83 | 498 |
| 130.004 | | Coffee Room | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 2 | 83 | 166 |
| 131.004 | | Capt Quackenbush | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 8 | 83 | 664 |
| 132.004 | | Capt Quackenbush bathroom | 2x2 3L F17T8 EL HE IS-Norm Troffer Parabolic | 1 | 46 | 46 |
| 133.004 | | Lt Purcell | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 2 | 83 | 166 |
| 134.004 | | Deputy Chief | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 6 | 83 | 498 |
| 135.004 | | Office of | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 16 | 83 | 1,328 |
| 136.004 | | Legal Affairs | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 10 | 83 | 830 |
| 137.004 | | Area | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 18 | 83 | 1,494 |
| 138.004 | | Area | 2x2 3L F17T8 EL HE IS-Norm Troffer Parabolic | 1 | 46 | 46 |
| 139.004 | | Directors | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 9 | 83 | 747 |
| 140.004 | | Doirectors | 2x2 3L F17T8 EL HE IS-Norm Troffer Parabolic | 1 | 46 | 46 |
| 141.004 | | C. Minoltas | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 3 | 83 | 249 |
| 142.004 | | Main Area | 2x4 3L F32T8 EL HE IS-Norm Troffer Parabolic | 22 | 83 | 1,826 |

Courthouse

City of Newark BPU Energy Audit Program

31 Green Street-Courthouse
CHA#21823

| Item | Qty. | Manuf | Model No. | Serial No. | Capacity | EER | Condition | Gas | MBH | Refrig. | Comments |
|----------------------------------|----------------------|-------|-------------------------|------------|-----------|-----|-----------|-----|-------|---------|--|
| Roof Top Units | | | | | | | | | | | |
| 10 | American Air Filter | | RCRM-ZDHAABYIM-33133187 | | | | | | | | |
| 2 | Manouth | | CWDESBFP-181-325 | | | | G | | | | |
| Heat Pump by Window | | | | | | | | | | | |
| 236 | Enercon | | SSACW-09210 | | | | G | | | | some have been upgraded to McQuay |
| Cooling Tower | | | | | | | | | | | |
| 1 | | | | | 5 HP FANS | | P | | | | 4 cell evaporative tower with 3 motors |
| Pump | | | | | | | | | | | |
| 2 | | | R357 | | | | | | | | |
| 2 | | | | | 40 hp | | P | | | | heating pumps on roof |
| 4 | Weinman | | | | 20 hp | | P | | | | heating pumps on roof |
| | | | | | 7.5 hp | | P | | | | glycol pumps on roof |
| Condensing Units | | | | | | | | | | | |
| 1 | Russell | | VAC-17-D | | | | | | | | |
| 1 | TRANE | | TTA090A300DA | | | | G | | | | |
| 1 | TRANE | | TWL736A1000AO | | | | G | | | | |
| 1 | American Standard | | 4A6H306OA1000AA | | | | G | | | | |
| Evaporator | | | | | | | | | | | |
| 1 | Koldwave | | | | | | | | | | |
| 1 | | | | | | | G | | | | water cooled serving data processing |
| 1 | | | | | | | G | | | | Customer Service room 105 |
| 1 | | | | | | | G | | | | Violations |
| 1 | | | | | | | G | | | | Room 108 |
| Boiler | | | | | | | | | | | |
| 1 | Kewanee | | L3S400-G06 | | 400 hp | | G | | 13390 | | |
| 1 | Kewanee | | L3S250-G06 | | 250 hp | | G | | 8369 | | |
| Domestic Hot Water Heater | | | | | | | | | | | |
| 1 | INDIRECT STEAM TANK | | | | | | | | | | |
| Exhaust Fans | | | | | | | | | | | |
| 1 | mushroom fan on roof | | | | | | | | | | cell block exhaust |
| 1 | mushroom fan on roof | | | | | | G | | | | toilet exhaust |
| 1 | mushroom fan on roof | | | | | | G | | | | toilet exhaust |

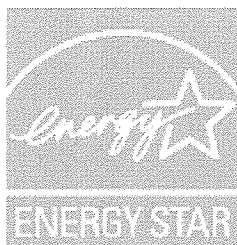
E = Excellent
G = Good
P = Poor

31 Green St

| Line# | Fir | Room Description | Qty | PWatts | Total Watts |
|-------------|-----|-------------------------------|---|--------|-------------|
| Court House | | | | | |
| 1.00 | 1 | Franklin Street Entrance | 2x4 3L F32/28T8 EL HE IS-Norm Troffer Para Grid | 10 72 | 720 |
| 2.00 | 1 | Police Business Office | 2x4 3L F32/28T8 EL HE IS-Norm Troffer Para Grid | 15 72 | 1,080 |
| 3.00 | 1 | 101 | 1x8 4L F32/28T8 EL HE IS-Norm Wrap Pendant | 1 98 | 98 |
| 4.00 | 1 | 101 | 2x4 3L F32/28T8 EL HE IS-Norm Troffer Para Grid | 21 72 | 1,512 |
| 5.00 | 1 | 101 | 1L Compact Fluorescent 23 Spiral Relamp | 3 23 | 69 |
| 6.00 | 1 | Stairs to Basement | 1x4 1L F32/28T8 EL HE IS-Norm Wrap Surface | 10 25 | 250 |
| 7.00 | 1 | Basement | 1x8 4L F32/28T8 EL HE IS-Norm Wrap Pendant | 1 98 | 98 |
| 8.00 | 1 | Basement | 1x4 2L F32/28T8 EL HE IS-Norm Wrap Pendant | 6 49 | 294 |
| 9.00 | 4 | Homicide | 2x4 3L F32/28T8 EL HE IS-Norm Troffer Para Grid | 25 72 | 1,800 |
| 10.00 | 4 | Homicide-Wood | 2x4 3L F32/28T8 EL HE IS-Norm Troffer Para Grid | 10 72 | 720 |
| 11.00 | 4 | Crime Analysis Unit | 2x4 3L F32/28T8 EL HE IS-Norm Troffer Para Grid | 9 72 | 648 |
| 12.00 | 4 | Lobby | 2x4 3L F32/28T8 EL HE IS-Norm Troffer Para Grid | 4 72 | 288 |
| 13.00 | 4 | Major Crimes | 2x4 3L F32/28T8 EL HE IS-Norm Troffer Para Grid | 36 72 | 2,592 |
| 14.00 | 4 | Major Crimes | 1L Compact Fluorescent 23 Spiral Relamp | 1 23 | 23 |
| 15.00 | 4 | Major Crimes | 2x2 3L F17T8 EL HE IS-Norm Troffer Parabolic | 1 46 | 46 |
| 16.00 | R | Roof- Elevator Generator Room | 1x4 2L F32/28T8 EL HE IS-Norm Wrap Pendant | 3 49 | 147 |
| 17.00 | 3 | Lobby | 2x4 3L F32/28T8 EL HE IS-Norm Troffer Para Grid | 4 72 | 288 |
| 18.00 | 3 | Kevin Schneider | 2x4 3L F32/28T8 EL HE IS-Norm Troffer Para Grid | 6 72 | 432 |
| 19.00 | 3 | Kevin Schneider-Closet | 2x2 3L F17T8 EL HE IS-Norm Troffer Parabolic | 1 46 | 46 |
| 20.00 | R | Roof- Flag Pole Light | Induction 150 Flood Photo Cell | 1 165 | 165 |
| 21.00 | 3 | CIB- Other Side | 2x4 3L F32/28T8 EL HE IS-Norm Troffer Para Grid | 23 72 | 1,656 |
| 22.00 | 3 | CIB-Captain Baraglio | 2x4 3L F32/28T8 EL HE IS-Norm Troffer Para Grid | 4 72 | 288 |
| 23.00 | 3 | CIB | 2x4 3L F32/28T8 EL HE IS-Norm Troffer Para Grid | 38 72 | 2,736 |
| 24.00 | 3 | CIB-Bathroom or Breakroom | 2x4 3L F32/28T8 EL HE IS-Norm Troffer Para Grid | 2 72 | 144 |
| 25.00 | 3 | Back Lockers | 1x8 4L F32/28T8 EL HE IS-Norm Wrap Pendant | 1 98 | 98 |
| 26.00 | 3 | Back Lockers | 1x4 2L F32/28T8 EL HE IS-Norm Wrap Pendant | 3 49 | 147 |
| 27.00 | 3 | Back Lockers | 2L F17T8 EL HE IS-Norm Relamp/Reballast | 4 32 | 128 |
| 28.00 | 3 | Forensics | 1x8 4L F32/28T8 EL HE IS-Norm Wrap Pendant | 1 98 | 98 |
| 29.00 | 2 | Lobby | 1x8 4L F32/28T8 EL HE IS-Norm Wrap Pendant | 1 98 | 98 |
| 30.00 | 2 | Lobby | 1x4 2L F32/28T8 EL HE IS-Norm Wrap Pendant | 4 49 | 196 |
| 31.00 | 2 | Locked Lobby | 2x4 3L F32/28T8 EL HE IS-Norm Troffer Para Grid | 8 72 | 576 |
| 32.00 | 2 | Missing Person / Sex | 2x4 3L F32/28T8 EL HE IS-Norm Troffer Para Grid | 29 72 | 2,088 |
| 33.00 | 2 | Missing Person / Sex | 1L Compact Fluorescent 23 Spiral Relamp | 1 23 | 23 |
| 34.00 | 2 | Interview | 2x4 3L F32/28T8 EL HE IS-Norm Troffer Para Grid | 2 72 | 144 |
| 35.00 | 2 | Conference Room | 2x4 3L F32/28T8 EL HE IS-Norm Troffer Para Grid | 3 72 | 216 |
| 36.00 | 2 | SVU Back Offices -Yellow | 2x4 3L F32/28T8 EL HE IS-Norm Troffer Para Grid | 14 72 | 1,008 |
| 37.00 | 2 | SVU Back Offices -Yellow | 2x2 3L F17T8 EL HE IS-Norm Troffer Parabolic | 1 46 | 46 |
| 38.00 | 2 | SVU Back Offices -Yellow | EXIT LED2 | 1 2 | 2 |
| 39.00 | 2 | Bathroom | 1L Compact Fluorescent 23 Spiral Relamp | 1 23 | 23 |
| 40.00 | 2 | Closet | 2x4 3L F32/28T8 EL HE IS-Norm Troffer Para Grid | 1 72 | 72 |
| 41.00 | 2 | Lt McPhee | 2x4 3L F32/28T8 EL HE IS-Norm Troffer Para Grid | 2 72 | 144 |
| 42.00 | 2 | Back Offices | 2x4 3L F32/28T8 EL HE IS-Norm Troffer Para Grid | 12 72 | 864 |

APPENDIX D

EPA Portfolio Manager



STATEMENT OF ENERGY PERFORMANCE

City Hall

Building ID: 2526155
 For 12-month Period Ending: July 31, 2010¹
 Date SEP becomes ineligible: N/A

Date SEP Generated: February 17, 2011

Facility
 City Hall
 920 Broad Street
 Newark, NJ 07102

Facility Owner
 City of Newark
 920 Broad Street
 Newark, NJ 07102

Primary Contact for this Facility
 N/A

Year Built: 1920
Gross Floor Area (ft²): 156,000

Energy Performance Rating² (1-100)

Site Energy Use Summary³

| | |
|-----------------------------------|-----------|
| Electricity - Grid Purchase(kBtu) | 2,008,986 |
| Natural Gas (kBtu) ⁴ | 178,700 |
| Total Energy (kBtu) | 2,187,686 |

Energy Intensity⁵

| | |
|-----------------------------------|----|
| Site (kBtu/ft ² /yr) | 14 |
| Source (kBtu/ft ² /yr) | 44 |

Emissions (based on site energy use)
 Greenhouse Gas Emissions (MtCO₂e/year)

N/A

Electric Distribution Utility

N/A

National Average Comparison

| | |
|---|--------|
| National Average Site EUI | 90 |
| National Average Source EUI | 285 |
| % Difference from National Average Source EUI | -84% |
| Building Type | Office |

| |
|--|
| |
| Stamp of Certifying Professional |
| Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate. |

Meets Industry Standards⁶ for Indoor Environmental Conditions:

| | |
|---|-----|
| Ventilation for Acceptable Indoor Air Quality | N/A |
| Acceptable Thermal Environmental Conditions | N/A |
| Adequate Illumination | N/A |

Certifying Professional
 N/A

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) or a Registered Architect (RA) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE or RA in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

| CRITERION | VALUE AS ENTERED IN PORTFOLIO MANAGER | VERIFICATION QUESTIONS | NOTES | <input checked="" type="checkbox"/> |
|-------------------------------|---------------------------------------|--|-------|-------------------------------------|
| Building Name | City Hall | Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings? | | <input type="checkbox"/> |
| Type | Office | Is this an accurate description of the space in question? | | <input type="checkbox"/> |
| Location | 920 Broad Street, Newark , NJ 07102 | Is this address accurate and complete? Correct weather normalization requires an accurate zip code. | | <input type="checkbox"/> |
| Single Structure | Single Facility | Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building | | <input type="checkbox"/> |
| City Hall Offices (Office) | | | | |
| CRITERION | VALUE AS ENTERED IN PORTFOLIO MANAGER | VERIFICATION QUESTIONS | NOTES | <input checked="" type="checkbox"/> |
| Gross Floor Area | 156,000 Sq. Ft. | Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area. | | <input type="checkbox"/> |
| Weekly operating hours | 60 Hours | Is this the total number of hours per week that the Office space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed. | | <input type="checkbox"/> |
| Workers on Main Shift | 525 | Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100. The normal worker density ranges between 0.3 and 5.3 workers per 1000 square feet (92.8 square meters) | | <input type="checkbox"/> |
| Number of PCs | 500 | Is this the number of personal computers in the Office? | | <input type="checkbox"/> |
| Percent Cooled | 50% or more | Is this the percentage of the total floor space within the facility that is served by mechanical cooling equipment? | | <input type="checkbox"/> |
| Percent Heated | 50% or more | Is this the percentage of the total floor space within the facility that is served by mechanical heating equipment? | | <input type="checkbox"/> |

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility:

| Fuel Type: Electricity | | |
|--|------------|--|
| Meter: Portion of Electric (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase | | |
| Start Date | End Date | Energy Use (kWh (thousand Watt-hours)) |
| 07/01/2010 | 07/31/2010 | 39,200.00 |
| 06/01/2010 | 06/30/2010 | 38,800.00 |
| 05/01/2010 | 05/31/2010 | 46,400.00 |
| 04/01/2010 | 04/30/2010 | 53,200.00 |
| 03/01/2010 | 03/31/2010 | 58,400.00 |
| 02/01/2010 | 02/28/2010 | 85,600.00 |
| 01/01/2010 | 01/31/2010 | 42,000.00 |
| 12/01/2009 | 12/31/2009 | 48,000.00 |
| 11/01/2009 | 11/30/2009 | 35,600.00 |
| 10/01/2009 | 10/31/2009 | 44,000.00 |
| 09/01/2009 | 09/30/2009 | 60,000.00 |
| 08/01/2009 | 08/31/2009 | 37,600.00 |
| Portion of Electric Consumption (kWh (thousand Watt-hours)) | | 588,800.00 |
| Portion of Electric Consumption (kBtu (thousand Btu)) | | 2,008,985.60 |
| Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu)) | | 2,008,985.60 |
| Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters? | | <input type="checkbox"/> |

| Fuel Type: Natural Gas | | |
|--|------------|---------------------|
| Meter: Cooking Gas (therms) Space(s): Entire Facility | | |
| Start Date | End Date | Energy Use (therms) |
| 07/01/2010 | 07/31/2010 | 144.00 |
| 06/01/2010 | 06/30/2010 | 155.00 |
| 05/01/2010 | 05/31/2010 | 145.00 |
| 04/01/2010 | 04/30/2010 | 166.00 |
| 03/01/2010 | 03/31/2010 | 173.00 |
| 02/01/2010 | 02/28/2010 | 180.00 |
| 01/01/2010 | 01/31/2010 | 144.00 |
| 12/01/2009 | 12/31/2009 | 134.00 |
| 11/01/2009 | 11/30/2009 | 135.00 |
| 10/01/2009 | 10/31/2009 | 139.00 |

| | | |
|---|------------|--------------------------|
| 09/01/2009 | 09/30/2009 | 128.00 |
| 08/01/2009 | 08/31/2009 | 144.00 |
| Cooking Gas Consumption (therms) | | 1,787.00 |
| Cooking Gas Consumption (kBtu (thousand Btu)) | | 178,700.00 |
| Total Natural Gas Consumption (kBtu (thousand Btu)) | | 178,700.00 |
| Is this the total Natural Gas consumption at this building including all Natural Gas meters? | | <input type="checkbox"/> |

| | |
|--|--------------------------|
| Additional Fuels | |
| Do the fuel consumption totals shown above represent the total energy use of this building? Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility. | <input type="checkbox"/> |

| | |
|---|--------------------------|
| On-Site Solar and Wind Energy | |
| Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported. | <input type="checkbox"/> |

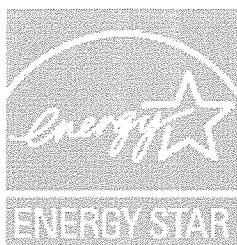
Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.



STATEMENT OF ENERGY PERFORMANCE

Police Building

Building ID: 2607499
 For 12-month Period Ending: February 28, 2010¹
 Date SEP becomes ineligible: N/A

Date SEP Generated: February 17, 2011

Facility
 Police Building
 22 Franklin Street
 Newark, NJ 07103

Facility Owner
 City of Newark
 920 Broad Street
 Newark, NJ 07102

Primary Contact for this Facility
 N/A

Year Built: 1900
Gross Floor Area (ft²): 22,972

Energy Performance Rating² (1-100)

Site Energy Use Summary³

| | |
|-----------------------------------|-----------|
| Electricity - Grid Purchase(kBtu) | 9,347,461 |
| Natural Gas - (kBtu) ⁴ | 0 |
| Total Energy (kBtu) | 9,347,461 |

Energy Intensity⁵

| | |
|-----------------------------------|------|
| Site (kBtu/ft ² /yr) | 407 |
| Source (kBtu/ft ² /yr) | 1359 |

Emissions (based on site energy use)
 Greenhouse Gas Emissions (MtCO₂e/year)

N/A

Electric Distribution Utility

N/A

National Average Comparison

| | |
|---|--------|
| National Average Site EUI | 95 |
| National Average Source EUI | 318 |
| % Difference from National Average Source EUI | 327% |
| Building Type | Office |

| |
|--|
| |
| Stamp of Certifying Professional |
| Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate. |

Meets Industry Standards⁶ for Indoor Environmental Conditions:

| | |
|---|-----|
| Ventilation for Acceptable Indoor Air Quality | N/A |
| Acceptable Thermal Environmental Conditions | N/A |
| Adequate Illumination | N/A |

Certifying Professional
 N/A

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) or a Registered Architect (RA) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE or RA in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

| CRITERION | VALUE AS ENTERED IN PORTFOLIO MANAGER | VERIFICATION QUESTIONS | NOTES | <input checked="" type="checkbox"/> |
|------------------------|---------------------------------------|--|-------|-------------------------------------|
| Building Name | Police Building | Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings? | | <input type="checkbox"/> |
| Type | Office | Is this an accurate description of the space in question? | | <input type="checkbox"/> |
| Location | 22 Franklin Street, Newark, NJ 07103 | Is this address accurate and complete? Correct weather normalization requires an accurate zip code. | | <input type="checkbox"/> |
| Single Structure | Single Facility | Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building | | <input type="checkbox"/> |
| Main Offices (Office) | | | | |
| CRITERION | VALUE AS ENTERED IN PORTFOLIO MANAGER | VERIFICATION QUESTIONS | NOTES | <input checked="" type="checkbox"/> |
| Gross Floor Area | 22,972 Sq. Ft. | Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area. | | <input type="checkbox"/> |
| Weekly operating hours | 125 Hours | Is this the total number of hours per week that the Office space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed. | | <input type="checkbox"/> |
| Workers on Main Shift | 150 | Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100. The normal worker density ranges between 0.3 and 5.3 workers per 1000 square feet (92.8 square meters) | | <input type="checkbox"/> |
| Number of PCs | 150 | Is this the number of personal computers in the Office? | | <input type="checkbox"/> |
| Percent Cooled | 50% or more | Is this the percentage of the total floor space within the facility that is served by mechanical cooling equipment? | | <input type="checkbox"/> |
| Percent Heated | 50% or more | Is this the percentage of the total floor space within the facility that is served by mechanical heating equipment? | | <input type="checkbox"/> |

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility:

| Fuel Type: Electricity | | |
|---|------------|--|
| Meter: Electric (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase | | |
| Start Date | End Date | Energy Use (kWh (thousand Watt-hours)) |
| 02/01/2010 | 02/28/2010 | 216,357.00 |
| 01/01/2010 | 01/31/2010 | 210,565.00 |
| 12/01/2009 | 12/31/2009 | 202,293.00 |
| 11/01/2009 | 11/30/2009 | 184,607.00 |
| 10/01/2009 | 10/31/2009 | 200,525.00 |
| 09/01/2009 | 09/30/2009 | 229,480.00 |
| 08/01/2009 | 08/31/2009 | 323,747.00 |
| 07/01/2009 | 07/31/2009 | 293,145.00 |
| 06/01/2009 | 06/30/2009 | 244,600.00 |
| 05/01/2009 | 05/31/2009 | 211,528.00 |
| 04/01/2009 | 04/30/2009 | 204,097.00 |
| 03/01/2009 | 03/31/2009 | 218,640.00 |
| Electric Consumption (kWh (thousand Watt-hours)) | | 2,739,584.00 |
| Electric Consumption (kBtu (thousand Btu)) | | 9,347,460.61 |
| Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu)) | | 9,347,460.61 |
| Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters? | | <input type="checkbox"/> |

| Additional Fuels | |
|--|--------------------------|
| Do the fuel consumption totals shown above represent the total energy use of this building? Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility. | <input type="checkbox"/> |

| On-Site Solar and Wind Energy | |
|---|--------------------------|
| Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported. | <input type="checkbox"/> |

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.