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March 5, 2008

Honorable Terry Dungan, Mayor  
Village of New Paltz  
25 Plattekill Avenue  
P.O. Box 877  
New Paltz, NY 12561

Report Number: S9-7-51

Dear Mayor Dungan:

A top priority of the Office of the State Comptroller is to help local government officials manage government resources efficiently and effectively and, by so doing, provide accountability for tax dollars spent to support government operations. The Comptroller oversees the fiscal affairs of local governments statewide, as well as compliance with relevant statutes and observance of good business practices. This fiscal oversight is accomplished, in part, through our audits, which identify opportunities for improving operations and Village governance. Audits also can identify strategies to reduce costs and to strengthen controls intended to safeguard local government assets.

In accordance with these goals, we conducted an audit of six municipalities throughout New York State. The objectives of our audit were to determine whether municipalities have realized cost savings through the acquisition and usage of solar panels, and what is the environmental impact of using solar panels? We included the Village of New Paltz in this audit. Within the scope of this audit, we examined the acquisition and implementation costs of the solar panels, electric bills, system specification documents, and interviewed local officials for the period January 1, 2003 through July 31, 2007. Following is a report of our audit of the Village of New Paltz. This audit was conducted pursuant to Article V, Section 1 of the State Constitution, and the State Comptroller's authority, as set forth in Article 3 of the General Municipal Law.

This report of examination letter provides findings and recommendations specific to the Village of New Paltz. We discussed the finding and recommendations with Village officials and considered their comments, which appear in Appendix A, in preparing this report. Village officials agreed with our findings and recommendations and plan to initiate corrective action. At the completion of our audit of the six municipalities, we will prepare a global report that summarizes the significant issues we identified in all of the local governments audited.

## Summary of Findings

The Village of New Paltz’s solar panel electrical system could save the Village as much as \$30,700, and will reduce their contribution of carbon dioxide, nitrous oxide and sulfur dioxide emissions of more than 392,000 pounds, over the life of the panels.

## Background and Methodology

Solar panels or photovoltaic devices installed on the roofs of buildings capture sunlight and convert it into electricity. This happens when the sunlight (“photo”) causes a molecular reaction on specially treated semi-conducting material such as silicon. The reaction creates a small amount of electricity (“voltaic”) which is gathered from all the cells on the panel and output as direct current (DC). This electricity is further converted into the standard alternating current (AC) through inverters, and then used to help power buildings or specific applications.

The New York State Energy and Research Development Authority (NYSERDA) provides many programs that administer government incentives to install energy efficient technologies, including grants and incentives to help offset the cost of installing solar panels. The NYSERDA funding can make the solar panels economically feasible.

The Village of New Paltz located in Ulster County has about 6,000 residents and covers 1.7 square miles with an annual operating budget of 7.3 million. The Village has about 11 municipal buildings and/or structures which use electricity. The following table (Table 1) illustrates total electricity usage and cost for the Village Hall, highway department garage, and fire department where the solar panels have been installed.

| <b>TABLE 1. ANNUAL ELECTRICITY USAGE</b> |             |             |             |             |              |
|--|-------------|-------------|-------------|-------------|--------------|
|  | <b>2003</b> | <b>2004</b> | <b>2005</b> | <b>2006</b> | <b>TOTAL</b> |
| Energy Usage (kWh)                       | 82,624      | 100,450     | 97,592      | 80,647      | 361,313      |
| Average Cost per (kWh)                   | .07         | .06         | .08         | .08         | .07          |
| Total Annual Cost <sup>1</sup>           | \$ 8,091    | \$ 9,084    | \$ 11,170   | \$ 9,376    | \$37,721     |

The Village installed a 15 kilowatt (kw) solar panel system on the Village highway department garage which supplies electricity to the Village Hall, adjacent Fire Department, and Town Police Department. The Town Police Department building is adjacent to the Village highway garage. The system became operational on September 21, 2005. Village officials indicated they did not undertake this project for cost savings primarily, but to lead by example in the effort to reduce reliance on traditional electricity sources. We reviewed the system specification documents, payment vouchers for the solar panel system installed, incentives, and actual metered output. We also interviewed officials and reviewed the utility bills from January 2003 to the end of fieldwork.

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<sup>1</sup> These costs also include demand charges, surcharges, and basic supply charges not affected directly or could not be reasonably assessed to determine the impact on the solar electricity produced.

We conducted this performance audit in accordance with generally accepted government auditing standards (GAGAS). Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

## **Audit Results**

### **Cost Benefit Analysis**

The solar panels were to be a joint Village and Town project with about 40 percent of the output going to the Town police department which shares an adjacent building. The project description indicates this was a joint project with the Village and Town; however the Village does not have any formal agreement specifying any cooperative arrangement relating to cost and usage of the solar panels, nor has the Town contributed to the costs of the project.

Based on their evaluation, officials decided to install solar panels on the roof of the highway garage and dedicate the electricity produced from the panels to the overall supply for the Village Hall, highway garage, and Town Police Department, reducing the amount needed to be purchased from the utility company. Traditional and solar panel produced electricity work together to meet the facility's electrical demands. The system pulls first from the solar panel power, and then uses the traditional electricity for the remaining needs. The system also provides backup power for emergency communication equipment.

The system has a 25-year warranty and an estimated useful life of 40 to 50 years. The main components of the system include solar panels capable of 15 kw of electricity per year, special inverters, and miscellaneous fixtures. The total cost of the system including parts, installation, and consulting was \$131,435. NYSERDA provided funding of \$91,390 and the Village paid the remaining \$40,045 or 31 percent. During our field work we found that the Village has not yet been reimbursed by NYSERDA. This was brought to their attention and they acted quickly seeking the reimbursement which was received prior to the end of our audit.

The Village uses revenue grade meters and a computer application to monitor the system's output and functionality. We reviewed all output from the date of operation through July 2007. The cost per kWh averaged \$.08 during the first year of operation. Overall, the system produced an average of 46 kWh per day, or 16,790 kWh annually. Being that the Village only receives about 60 percent or 26 kWh per day from the panels the payback period is much greater. Factoring in standard inflation<sup>2</sup> rates, we estimate that the municipalities' payback period will be about 33 years. Had the Town contributed to their share of the costs, the payback period would be about 21 years. The units come with a 25-year warranty on the panels and 5-10 years on the other parts with estimated useful life of the system between 40 to 50 years. The following table (Table 2) illustrates the potential accumulated cost savings to the Village from use of the system.

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<sup>2</sup> Analysis of NYS Commercial Energy Prices from 1991 – 2005.

| <b>TABLE 2. TOTAL ACCUMULATED SAVINGS</b> |                            |   |
|---|----------------------------|---|
| <b>Time Period</b>                        | <b>Accumulated Savings</b> | <b>Savings in Excess of Village Costs</b> |
| 33 Years – (Return on Investment Period)  | \$ 40,045                  | \$ 0                                      |
| After 40 Years                            | \$ 50,500                  | \$ 10,455                                 |
| After 50 Years                            | \$ 70,745                  | \$ 30,700                                 |

### **Environmental Impact**

The Village’s electrical energy needs are provided through Central Hudson Gas and Electric. About 43 percent is generated from oil, gas, and coal; the remainder is produced from nuclear, hydro and refuse. All these sources, except for nuclear and hydro, which are considered clean alternatives, produce certain pollutants and have negative impacts on the environment. A study released by the National Academy of Sciences<sup>3</sup> confirmed that greenhouse gases are accumulating in the Earth’s atmosphere as a result of human activities contributing to global warming. Carbon dioxide (CO<sub>2</sub>) emissions contribute to global warming and nitrous oxides (N<sub>2</sub>O) and sulfur dioxides (SO<sub>2</sub>) are key pollutants that contribute to smog and acid rain. The total energy produced by the Village’s solar panel system not only produces costs savings for the Village, but also has direct environmental benefits.

Electricity produced by the solar panels has no emission or byproduct that negatively affects the environment. Conversely, each kWh of traditional electricity produced has emissions or byproducts from the production of that electricity. For example, each kWh of electricity produced by the utilities, for consumption by its customers, results in .82 pounds of carbon dioxide emission, .001 pounds of nitrous oxide emission, and .0042 pounds of sulfur dioxide emission. The following table (Table 3) illustrates the avoided emission equivalents of the pollutants that would have been created from generating traditional power instead of using the solar panels:

| <b>TABLE 3. Pollution Emission Equivalents (lbs)</b> |                                |                 |                 |                 |
|--|--------------------------------|-----------------|-----------------|-----------------|
| <b>Pollutants</b>                                    | <b>Emissions (lbs per kWh)</b> | <b>Annually</b> | <b>40 Years</b> | <b>50 Years</b> |
| Carbon Dioxide Emissions (lbs)                       | .82                            | 7,782           | 311,372         | 389,090         |
| Nitrous Oxide (lbs)                                  | .001                           | 9               | 378             | 472             |
| Sulfur Dioxide (lbs)                                 | .0042                          | 40              | 1,593           | 1,991           |

Because the Village of New Paltz installed the solar panels that produce about 16,425 kWh of electricity annually, it has directly contributed to the preservation of the environment through avoided emissions. Since their actual benefit has to be reduced by 40 percent to 9,490 kWh annually due to the sharing with the Town, their total effect also has to be adjusted. Further, had the Village used traditional electricity, it would have contributed to releasing about 7,831 pounds

<sup>3</sup> Entitled “Climate Change Science Report,” issued 2001.

of these pollutants annually, and up to 392,000 pounds during the life of the panels, into the atmosphere. For perspective, since vehicles annually emit about 5.7 tons of carbon dioxide, over the 50-year life of the solar panels this would equate to the elimination of the carbon dioxide produced by about 34 vehicles.

### **Recommendation**

1. The Village should continue to explore alternative energy resources and expand the use of those technologies that reduce its energy costs and protect the environment.
2. The Village Board should discuss the intent of the project with the Town of New Paltz to determine whether or not reimbursement of part of the implementation costs to the Village was intended and therefore should occur. In addition, the Village should establish a formal written agreement defining the usage split for the solar panels with the Town and any other terms and conditions deemed appropriate by both parties.

The Board has the responsibility to initiate corrective action. Pursuant to Section 35 of the General Municipal Law, the Board should prepare a plan of action that addresses the recommendations in this report and forward the plan to our office within 90 days. For guidance in preparing your plan of action, you may refer to applicable sections in the publication issued by the Office of the State Comptroller entitled *Local Government Management Guide*. We encourage the Board to make this plan available for public review in the Village Clerk-Treasurer's office. If you have any further questions, please contact the Statewide and Regional Projects Unit at (607) 721-8306.

Sincerely,

Steven J. Hancox  
Deputy Comptroller  
Office of the State Comptroller  
Division of Local Government  
and School Accountability

## **APPENDIX A**

The Village officials' response to this audit can be found on the following page.



*Terry Dungan, Mayor*  
*Michael Zierler, Deputy Mayor*  
*Trustees: Jean Gallucci, Shari Osborn, Mark Portier*

*Nancy Branco*  
*Treasurer*

*Gene Bleu Terwilliger*  
*Superintendent Public Works*

*Brittany Turner*  
*Clerk*

December 20, 2007

[REDACTED]  
Binghamton Regional Office  
Office of the State Comptroller  
44 Hawley Street  
Binghamton, New York 13901-4417

Dear [REDACTED]:

This letter is in response to the audit findings of the Solar Panel Project for the Village of New Paltz. After reviewing the audit, we are in agreement with your findings.

As the Village of New Paltz has had a change of Administration effective June 1, 2007, At the time of your audit we had not submitted or received our funding from NYSERDA, however since the audit we have submitted and received our check from NYSERDA in the amount of \$91,390.00.

The Mayor for the Village of New Paltz has met with the Supervisor for the Town of New Paltz and will be investigating and implementing an agreement for the 40% of the solar power that the Town of New Paltz police department building is receiving.

The Village of New Paltz is currently in the process of following up with Central Hudson regarding the accrued benefits we should have been receiving from net metering.

If you need or require additional information, please feel free to contact me at (845)255-0130.

Sincerely,

Nancy Branco  
Treasurer