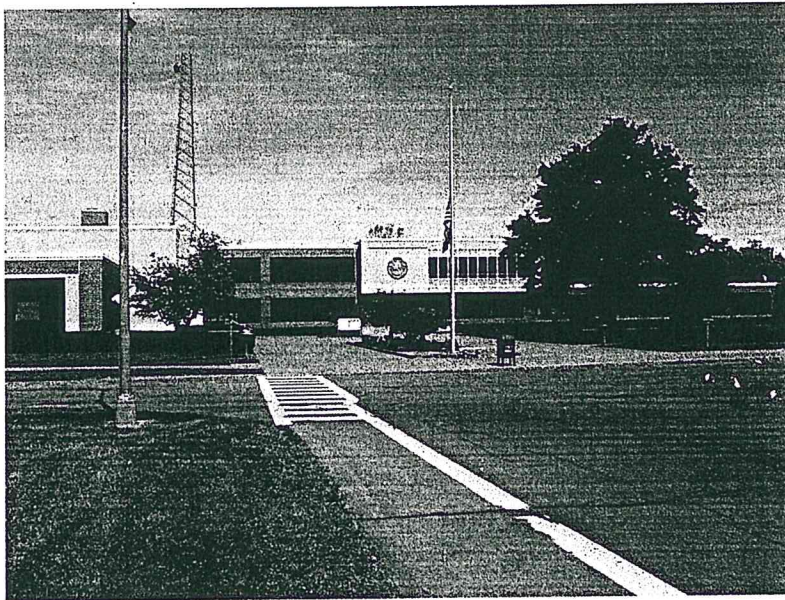

SIEMENS

ENERGY PERFORMANCE CONTRACT PERFORMANCE ASSURANCE REPORT

Warren County Municipal Center



Report Period:
Performance Year 2: October 1, 2009 – September 30, 2010

Siemens Industry, Inc.

Latham, NY

PERFORMANCE SOLUTIONS AGREEMENT OVERVIEW

Client: Warren County Municipal Center

Contact: Paul Dusek, County Attorney

Contract Date: April 20, 2007

Performance Period: October 2008 – September 2023

Contract Term: 15 Years

Performance Assurance Specialist: William P. Casey

Service Specialist: Bob St. John

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1. Executive Summary

Your Energy Performance Contract with Siemens guaranteed **\$229,851** in total annual savings for Year 2 of the Performance Period (Table 1). Verified savings for Year 2 were **\$246,967**, resulting in an excess savings of **\$17,116**. Through the end of the second performance period, the Warren County Municipal Center has realized \$485,218 in accumulated realized savings, which is \$33,639 in excess of the guarantee.

Table 1. Summary of annual guaranteed and verified savings.

Performance Year	Measured & Verified Savings	Stipulated Operational Savings	Total Verified Savings	Annual Guaranteed Savings	Deviation From Plan
1	\$ 156,633	\$ 81,617	\$ 238,250	\$ 221,728	\$ 16,522
2	\$ 162,901	\$ 84,066	\$ 246,967	\$ 229,851	\$ 17,116
3				\$ 238,277	
4				\$ 247,018	
5				\$ 256,086	
6				\$ 265,493	
7				\$ 275,252	
8				\$ 285,377	
9				\$ 295,880	
10				\$ 306,778	
11				\$ 318,084	
12				\$ 329,815	
13				\$ 341,986	
14				\$ 354,615	
15				\$ 367,718	
YTD TOTALS	\$ 319,535	\$ 165,683	\$ 485,218	\$ 1,733,705	\$ 33,639

2. Performance Assurance Overview

2.1. Measurement and Verification Methods

Realized savings were calculated using the methodology described in Exhibit C of the energy performance contract between Warren County Municipal Center and Siemens. There are four guarantee options to measure and verify savings: Option A - Measured Capacity, Option B - Measured Consumption, Option C - Main Meter Comparison, and Option D - Stipulated.

Option A - Measured Capacity. This approach is intended for Facility Improvement Measures where a one-time measurement for specific equipment or systems instantaneous baseline energy use, and a one-time measurement for specific equipment or systems instantaneous post-implementation (Post) energy use can be measured. Baseline and Post energy consumption is calculated by multiplying the measured end use instantaneous capacity (i.e. – kW, Gal/hr, BTU/hr) by stipulated hours of operation for each mode of operation (i.e. – hours, week, month). The calculations for energy consumption will be defined in the Measurement and Verification article of this Exhibit C. The work sequence required for data collection, evaluation, and reporting will be defined in the Measurement and Verification article of this Exhibit A.

Option B - Measured Consumption. This approach is intended for Facility Improvement Measures where continuous periodic measurements for specific equipment or systems baseline energy use, and continuous periodic measurements for that equipment or systems post-implementation (Post) energy use can be measured. The calculations for energy consumption will be defined in the Measurement and Verification article of this Exhibit C. Periodic inspections and consumption measurements of the equipment or systems will be necessary to verify the on-going efficient operation of the equipment and saving attainment. The predetermined schedule for data collection, evaluation, and reporting will be defined in the Performance Assurance Technical Support Program article of this Exhibit A.

Option C - Main Meter Comparison. This approach is intended for measurements of the whole-facility or specific meter baseline energy use, and measurements of whole-facility or specific meter post-implementation (Post) energy use can be measured. The methodology to establish baseline and Post parameter identification, modeling approach and baseline or model adjustments will be defined in the Measurement and Verification article of this Exhibit C. Periodic inspections of baseline energy usage, operating practices, and facility and equipment, and meter measurements of the will be necessary to verify the on-going efficient operation of the equipment, systems, practices and facility, and saving attainment. The predetermined schedule for data collection, evaluation, and reporting will be defined in the Performance Assurance Technical Support Program article of this Exhibit A.

Option D - Stipulated. This approach is intended for Facility Improvement Measures where the end use capacity or operational efficiency; demand, energy consumption or power level; or manufacturer's measurements, industry standard efficiencies or operating hours are known in advance, and used in a calculation or analysis method that will stipulate the outcome. Both CLIENT and SIEMENS agree to the stipulated inputs and outcome(s) of the analysis methodology. Based on the established analytical methodology the savings stipulated will be achieved upon completion of the Facility Improvement Measures Work and that no further measurements or calculations will need to be performed. The methodology and calculations to establish savings value will be defined in the Measurement and Verification article of this Exhibit C.

2.2. Guaranteed Savings

Guaranteed energy cost savings are escalated at 4% annually and avoided cost savings are escalated at 3% annually (Table 2). Guaranteed energy units are not escalated and are shown below in Table 3.

Table 2. Total Guaranteed Energy Savings Dollars.

Year	Energy/ Utility Savings	Maintenance Savings	Avoided Annual Chemical Cost	Avoided Heat Pump & Cooling Tower Cost	Total Savings
1	\$140,111	\$33,950	\$5,000	\$42,667	\$221,728
2	\$145,785	\$43,947	\$5,150	\$34,969	\$229,851
3	\$151,690	\$45,265	\$5,305	\$36,018	\$238,277
4	\$157,833	\$46,623	\$5,464	\$37,098	\$247,018
5	\$164,225	\$48,022	\$5,628	\$38,211	\$256,086
6	\$170,877	\$49,463	\$5,796	\$39,357	\$265,493
7	\$177,797	\$50,947	\$5,970	\$40,538	\$275,252
8	\$184,998	\$52,475	\$6,149	\$41,754	\$285,377
9	\$192,490	\$54,049	\$6,334	\$43,007	\$295,880
10	\$200,286	\$55,671	\$6,524	\$44,297	\$306,778
11	\$208,398	\$57,341	\$6,720	\$45,626	\$318,084
12	\$216,838	\$59,061	\$6,921	\$46,995	\$329,815
13	\$225,620	\$60,833	\$7,129	\$48,405	\$341,986
14	\$234,757	\$62,658	\$7,343	\$49,857	\$354,615
15	\$244,265	\$64,538	\$7,563	\$51,352	\$367,718

Table 3. Total Guaranteed Energy Savings Units.

	Electric Energy Saved (kWh)	Natural Gas Saved (Therms)
Annual Quantity	693,540	29,936

Table 4. Guaranteed cost savings by facility improvement measure for the current performance year.

	Escalated Guaranteed Savings							Operational Savings				
	Energy or Utility Savings							Guarantee Types				
	Guarantee Type Options							Guarantee Types				
	A Measured Capacity	B Measured Consumption	C Main Meter Comparison	D Stipulated	Total	B Measured Consumption	D Stipulated	Total				
FIM												
Lighting Retrofit	\$ 34,919				\$ 34,919			\$ -				\$ -
Geothermal Heat Pump	\$ 64,929				\$ 64,929			\$ -				\$ -
Maintenance Savings								\$ 43,947				\$ 43,947
EMS Night Set Back and Shutdown		\$ 43,198			\$ 43,198			\$ -				\$ -
Vending Machine Control				\$ 997	\$ 997			\$ -				\$ -
Domestic Hot Water Boiler Replacement	\$ 1,742				\$ 1,742			\$ -				\$ -
Heat Pump Deferred Maintenance								\$ 34,969				\$ 34,969
Avoided Annual Chemical Cost								\$ 5,150				\$ 5,150
					\$ 145,785			\$ 84,066				\$ 84,066

2.3. Contracted Baseline Data

Table 5. Contracted baseline utility data.

Units	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
Electric kWh	177,600	166,800	167,600	144,800	113,600	127,600	165,600	142,600	141,200	142,800	112,000	126,800
Electric kW	408	404	396	364	356	284	324	312	320	304	276	388
N. Gas Therm	576	507	580	501	2,035	5,063	8,248	6,852	7,947	5,095	2,012	1,169

2.4. Utility Rate Structures and Escalation Rates

Utility Rates are escalated by 4% annually as detailed in the performance contract.

Table 5. Escalated utility rates for the 1-year performance period.

Year	\$/kWh	\$/kW	\$/Therm
Baseline	\$0.1480	\$14.97	\$1.25
1	\$0.1539	\$15.57	\$1.30
2	\$0.1601	\$16.19	\$1.35
3	\$0.1665	\$16.84	\$1.41
4	\$0.1731	\$17.51	\$1.46
5	\$0.1801	\$18.21	\$1.52
6	\$0.1873	\$18.94	\$1.58
7	\$0.1948	\$19.70	\$1.64
8	\$0.2025	\$20.49	\$1.71
9	\$0.2107	\$21.31	\$1.78
10	\$0.2191	\$22.16	\$1.85
11	\$0.2278	\$23.05	\$1.92
12	\$0.2370	\$23.97	\$2.00
13	\$0.2464	\$24.93	\$2.08
14	\$0.2563	\$25.92	\$2.16
15	\$0.2665	\$26.96	\$2.25

2.5. Baseline Operating Parameters

The baseline operating parameters agreed upon in the performance contract are as follows:

The facility is occupied approximately 60 hours per week (52 weeks per year) for consideration of the setback schedule.

The operating occupied schedule will be:
Monday through Friday from 6:30 am to 6:30 pm
The facility will be in unoccupied mode for the remainder of the time.

Proposed Unoccupied Temperatures
Summer - 78 degrees Fahrenheit
Winter - 55 degrees Fahrenheit

Proposed Occupied Temperatures
Summer - 72 degrees Fahrenheit
Winter - 69 degrees Fahrenheit

3. Performance Assurance Results

3.1. Summary of Guaranteed and Verified Energy Savings

	Guaranteed Savings	Verified Savings
Lighting Retrofit	\$ 34,919	\$ 45,775
Geothermal Heat Pump System	\$ 64,929	\$ 72,880
Energy Management System	\$ 43,198	\$ 42,274
Vending Machine Control	\$ 997	\$ 1,039
DHW Boiler Replacement	\$ 1,742	\$ 934
Operational Savings	\$ 84,066	\$ 84,066
Total Savings	\$ 229,851	\$ 246,967

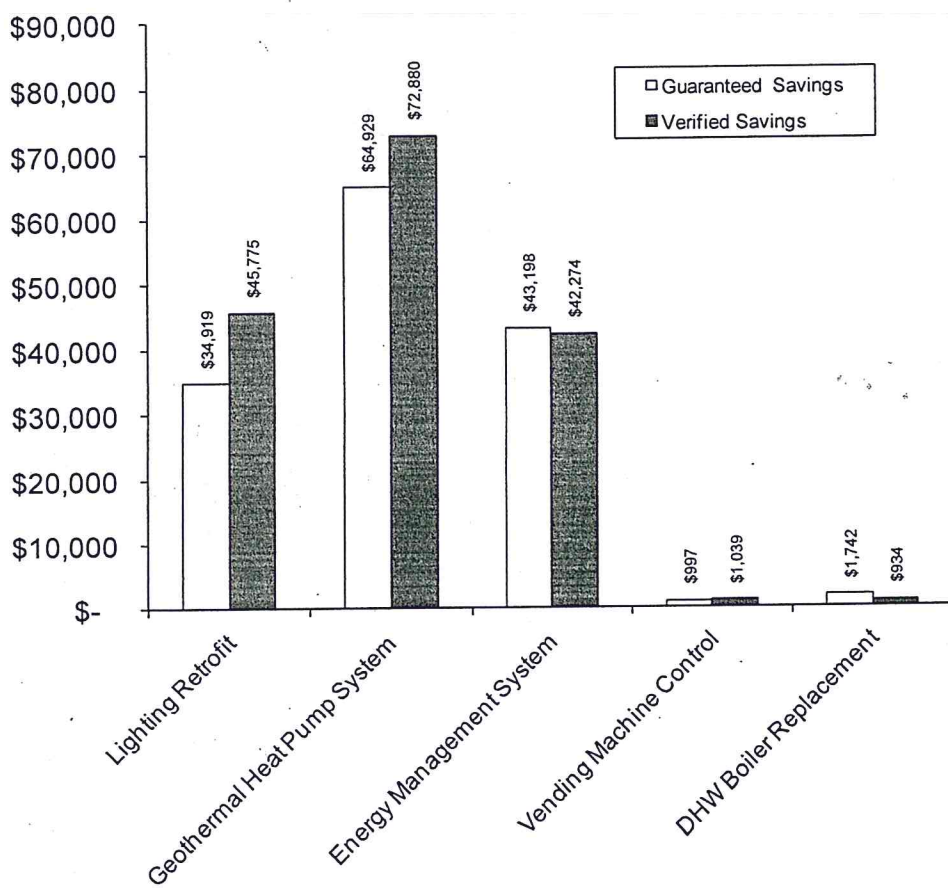


Figure 1. Guaranteed and verified cost savings per facility improvement measure for current performance year.

3.2. Option A Savings

Lighting Retrofit

Lighting upgrades included conversion to energy efficient technologies including lamps, ballasts, and/or the installation of secular reflectors and occupancy sensors, while maintaining or elevating to prescribed illumination levels.

Lighting	
Total kWh Savings	238,695
Cost per kWh	\$0.1601
kWh Cost Savings	\$38,210
Total kW	467.27
Cost per kW	\$16.19
kW Cost Savings	\$7,566
Total Cost Savings	45,775

Domestic Hot Water Boiler Replacement

Siemens replaced the existing domestic hot water boiler with two tankless on-demand water heaters to satisfy the facilities domestic hot water needs.

Domestic Water Boiler Replacement	
Total Gas Savings Adjusted	691
Cost per Therm	\$1.35
Gas Cost Savings	\$934
Total Cost Savings	\$934

Geothermal Heat Pump System

Siemens replaced the existing water-source heat pump system and installed a full geothermal heat pump system. The existing cooling tower was also eliminated. A new high-efficiency condensing boiler and two existing boilers are used to supplement heat needed to maintain supply water temperature in the heat pump loop.

Geothermal System Savings	
Circulation Pump kWh Savings	73,146
Cost per kWh	\$0.1601
Circulation Pump kWh Savings	\$11,709
Total kW Savings	166
Cost per kW	\$16.19
Circulation Pump kW Savings	\$2,689
Year 1 Boiler Therms Saved	24,036
Cost per Therm	\$1.35
Total Boiler Gas Cost Savings	\$32,497
Geothermal Heat Pump kWh Savings	162,325
Cost per kWh	\$0.1601
Total Circulation Pump Savings	\$25,985
Total Cost Savings	\$72,880

Energy Management System Upgrades

Siemens installed an Energy Management System (EMS) to perform occupied and unoccupied scheduling and temperature setback for the heat pump system in the Municipal Center. Although schedules have been maintained in accordance with the performance contract, occupied and unoccupied room setpoints have not. Summer occupied and unoccupied setpoints were to be maintained at 72 °F and 78 °F, respectively. Actual average summer setpoints were 74.1 and 74.3 °F during occupied and unoccupied periods, respectively (see table below and Figure 2). Winter occupied and unoccupied setpoints were to be maintained at 69 °F and 55 °F, respectively. Actual average winter setpoints were 72.1 and 71.8 for occupied and unoccupied periods, respectively.

Warren County Municipal Center is responsible for scheduling and setpoint adjustments through the EMS. Trend data show the gradual adjustment of occupied and unoccupied setpoints in favor of comfort during the winter, but at the expense of additional energy use. During the summer, the average room setpoint is increased during the daytime, suggesting the existing programmed setpoints may be lower than necessary for occupant comfort, which again results in unnecessary energy consumption. Until the setback controls are reset to their original schedule, the savings associated with this FIM will be stipulated at the full guaranteed value.

Energy Management System	
Total kWh Savings Adjusted	226,197
Cost per kWh	\$0.1601
kWh Cost Savings	\$36,209
Total Gas Savings Therms	4,486
Cost per Therm	\$1.35
Gas Cost Savings	\$6,065
Total Cost Savings	\$42,274

	Average Winter Rm Temp (°F)	Average Winter Temp Setpoint (°F)	Average Summer Rm Temp (°F)	Average Summer Temp Setpoint (°F)
Occupied Hours				
Actual	72.4	72.1	74.3	74.1
Contract		69.0		74.0
Variation	3.4	3.1	0.3	0.1
Unoccupied Hours				
Actual	71.9	71.8	74.0	74.3
Contract		55.0		78.0
Variation	16.9	16.8	-4.0	-3.7

Warren County Municipal Center
Performance Assurance Report, Year 2

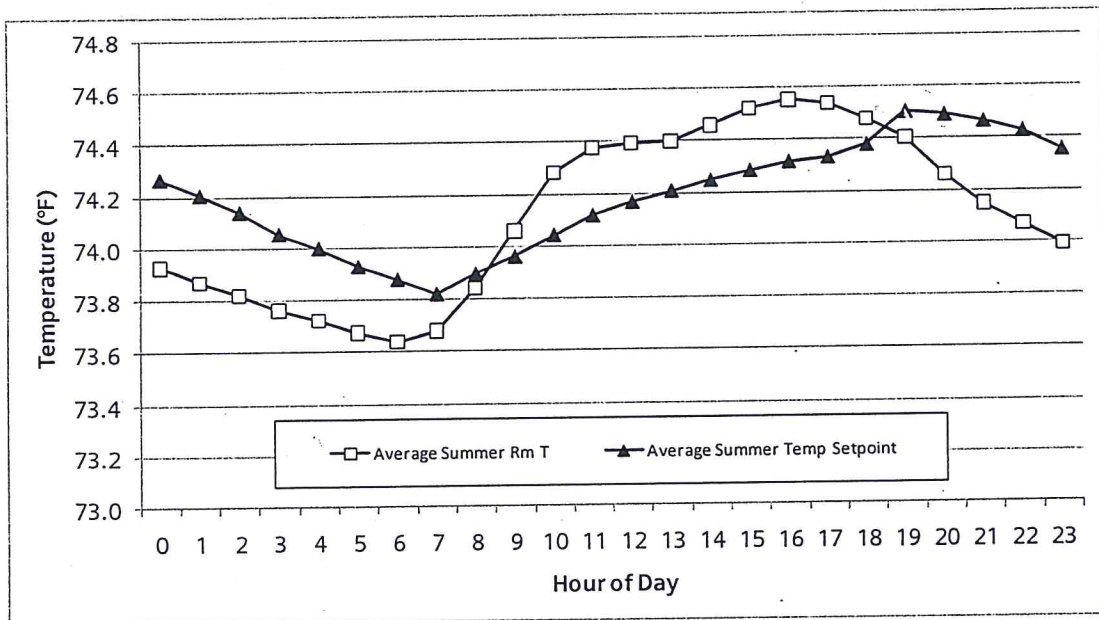
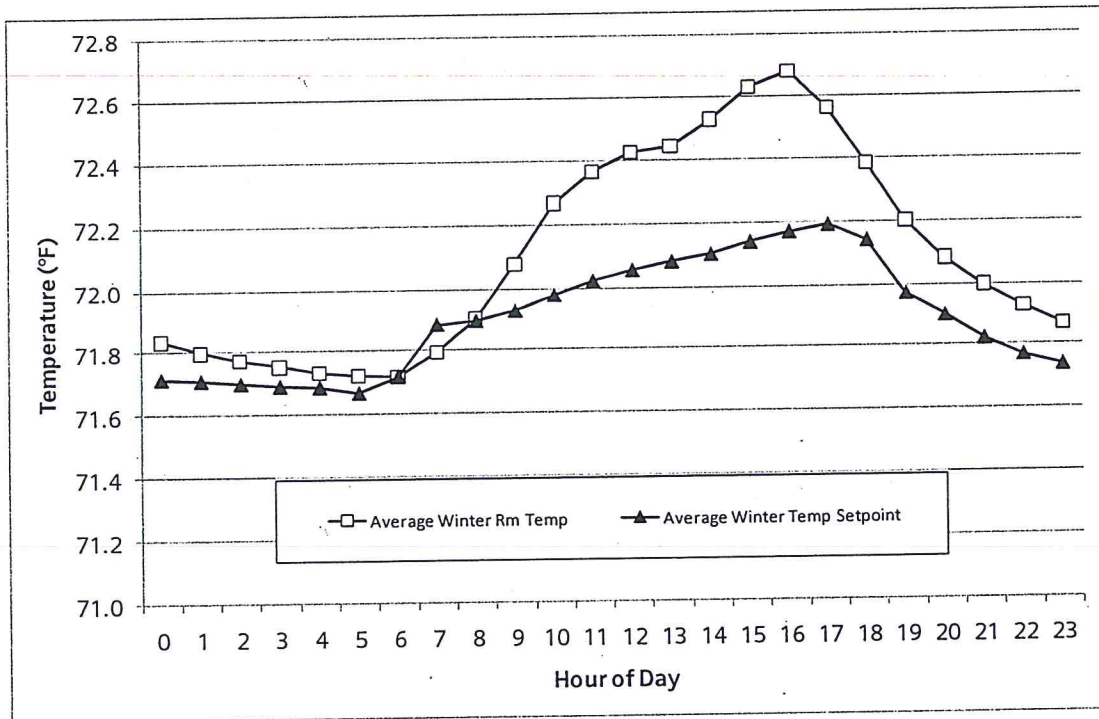


Figure 2. Hourly profiles of average winter (top) and summer (bottom) room temperatures and control setpoints.

3.4. Option D Savings

Total Option D savings were \$85,105 and resulted from avoided maintenance and avoided annual chemical costs as well as the savings from the vending machine controls measure described below.

Vending Machine Controls

The vending miser installation significantly reduces electrical consumption by vending machines. The annual savings for this measure has been stipulated as agreed upon by the Warren County Municipal Center and Siemens. The annual stipulated cost savings for this measure are based on the engineering calculations used to estimate these savings in the detailed energy audit (DEA) performed by Siemens as part of the development of this performance contract.

Vending Machine Controls	
Total kWh Savings Adjusted	6,488
Cost per kWh	\$0.1601
kWh Cost Savings	\$1,039
Total Cost Savings	\$1,039