Grants – NJ Smart Start

ECM Summary

The New Jersey SmartStart Buildings provide incentives for eligible equipment installation and replacement according to New Jersey Clean Energy Website. Eligible equipment includes:

Water and air-cooled electric chillers

Gas cooling

Electric Unitary HVAC

Ground Source Heat Pumps

Gas Heating

Variable Frequency Drives

Natural Gas Water Heating

Premium Motors

Prescriptive Lighting

Lighting Controls

Refrigeration

Johnson Controls Inc. will pursue all NJ Smart Start equipment incentives that are applicable to the customer's project. Addition incentives may be available for equipment and schools which were affected by Hurricane Sandy. At this time the Smart Start incentives are being increased by 50% for qualified equipment purchases between October 29, 2012 and June 30, 2013. Johnson Controls will work with the District once selected in order to schedule any necessary purchase prior to this cut-off date in order to receive as much incentive funding as possible.

This measure will be coordinated with the Pay for Performance Program in order to maximize the financial incentive to Ocean Township Schools.

Any incentive checks received will be paid directly to the school district.

Facilities Recommended for this Measure

Administration Building

Ocean Township High School

Ocean Township Intermediate School

Ocean Township Elementary School

Wanamassa Elementary School

Wayside Elementary School

Scope of Work

Johnson Controls will work with the District to apply for all applicable equipment incentives.

Johnson Controls will complete all paper work and handle all administration with the NJ Smart Start program coordinator.

Incentive checks shall be mailed directly to Wayne Township Public Schools

As part of the RFP Response, Johnson Controls has calculated the estimated Smart Start incentives available for many of the measures. During the Investment Grade Energy Audit, the incentives will be re-calculated based on the applicable incentives at the time of final submittal.

At this time, the estimated Smart Start incentives for Ocean Township Schools are outlined below. Upon final selection of the ECMs, these incentive amounts will be updated to the latest forms.

Building	ECM Description	Estimated SmartStart Incentive
Administration Building	Exterior Building Lighting	$300
Ocean Township High School	Exterior Building Lighting	$2,665
Ocean Township Elementary School	Exterior Building Lighting	$570
Ocean Township Intermediate School	Exterior Building Lighting	$1,505
Wanamassa Elementary School	Exterior Building Lighting	$2,335
Wayside Elementary School	Exterior Building Lighting	$3,700
Administration Building	Interior Lighting Retrofits	$3,065
Ocean Township High School	Interior Lighting Retrofits	$5,730
Ocean Township Elementary School	Interior Lighting Retrofits	$2,100
Ocean Township Intermediate School	Interior Lighting Retrofits	$7,455
Wanamassa Elementary School	Interior Lighting Retrofits	$2,345
Wayside Elementary School	Interior Lighting Retrofits	$2,345
Ocean Township High School	Kitchen Hood Controls	$900
Ocean Township Elementary School	Kitchen Hood Controls	$900
Ocean Township Intermediate School	Kitchen Hood Controls	$900
Ocean Township Elementary School	Domestic Hot Water Fuel Conversion	$350
Total		$36,865

Savings Methodology

The incentives have been calculated based on the most recent NJ Smart Start incentive forms as stated on the New Jersey Clean Energy website.

Maintenance Requirements

Not applicable.

Benefits

Project funding.

Public acknowledgement of District's efforts toward energy responsibility.

Pay for Performance

ECM Summary

Johnson Controls is a partner in the New Jersey Pay for Performance Program. This program allows schools district to obtain rebate for energy savings project above and beyond the standard NJ Smart program when energy savings exceeds 15% of the baseline usage for each school. We expect that many of the Ocean Township School District buildings will be eligible for this rebate program.

The Pay for Performance for Existing Buildings Program takes a comprehensive, whole-building approach to saving energy in existing facilities through incentives that are directly linked to savings. Pay for Performance program relies on a network of partners who provide technical services under direct contract to you. Acting as your energy expert, your partner will develop an energy reduction plan for each project with a whole-building technical component of a traditional energy audit, a financial plan for funding the energy efficient measures and a construction schedule for installation.

Eligibility

Existing commercial, industrial and institutional buildings with a peak demand over 200 kW for any of the preceding twelve months are eligible to participate including hotels and casinos, large office buildings, multi-family buildings, supermarkets, manufacturing facilities, schools, shopping malls and restaurants. Buildings that fall into the following five customer classes are not required to meet the 200kW demand in order to participate in the program: hospitals, public colleges and universities, non-profits, affordable multifamily housing, and local governmental entities. Your energy reduction plan must define a comprehensive package of measures capable of reducing the existing energy consumption of your building by 15% or more.

Facilities Recommended for this Measure

Administration Building

Ocean Township High School

Ocean Township Intermediate School

Ocean Township Elementary School

Wanamassa Elementary School

Wayside Elementary School

Scope of Work

The following services will be provided during the development of the ESP for Ocean Township Schools:

Coordinate with the school district to complete and submit the Pay for Performance Application

Develop and submit Energy Reduction Plan to Pay for Performance Case Manager

Complete and submit Request for Incentive #1

Conduct necessary reviews with Pay for Performance Case Manager

During and after installation of measures is complete the following services will be provided:

Complete and submit request for Incentive #2

Conduct necessary reviews with Pay for Performance Case Manager to ensure equipment has been installed according to scope of work submitted in ERP and ESIP

After year 1 of performance period:

Complete post-construction benchmarking report

Complete and submit with request for Incentive #3

Conduct necessary reviews for Incentive #3

At this time, Johnson Controls anticipates the receipt of the following Pay for Performance incentives for the sample project: Once final selection of measures is complete, Johnson Controls will update the incentive estimates.

Building	Incentive #1	Incentive #2	Incentive #3	Total
Admin Building	$2,500	$16,646	$16,646	$35,792
Ocean Township High School	$10,011	$75,481	$75,481	$160,973
Ocean Township Intermediate School	$12,870	$86,082	$86,082	$185,034
Ocean Township Elementary School	$3,808	$21,298	$21,298	$46,404
Wanamassa Elementary School	$2,979	$26,164	$26,164	$55,307
Wayside Elementary School	$7,369	$29,056	$29,056	$65,481
TOTAL	**$39,537**	**$254,727**	**$254,727**	**$548,991**

Savings Methodology

The incentives have been calculated based on the most recent Pay for Performance policies as stated on the New Jersey Clean Energy website.

Maintenance Requirements

Not applicable.

Benefits

Source of revenue throughout the first several years of project development and implementation.

Public acknowledgement of District's efforts toward energy responsibility.

PC Power Management

ECM Summary

Personal computers' (PCs) energy consumption waste within a facility is very often ignored. PCs are typically left on by the users even if they are not being used. Johnson Controls proposes to reduce this wasted energy through implementing a program that automatically and centrally manages power settings through a network based program.

Facilities Recommended for this Measure

Administration Building

Ocean Township High School

Ocean Township Intermediate School

Ocean Township Elementary School

Wanamassa Elementary School

Wayside Elementary School

Scope of Work

JCI will quickly and efficiently install the server and its clients for the personal computer power management system.

A total of 580 networked desktop computers will be affected

JCI will initiate a pre-installation planning meeting to confirm any relevant network characteristics and define the project's timeline and responsibilities. The client software will be deployed, implemented and configured on the District's network either remotely or manually.

Once installed, the JCI team will train the customer's system administrators and reporting tool users.

The JCI team will help assure the District's success through our annual maintenance program. This provides our customers with ongoing technical support, software updates and upgrades, and an annual Network Energy Analysis to confirm the most effective use of the system and allow for any incremental changes.

Savings Methodology

In general, savings calculations for PC power management are calculated using the following methodology:

Savings Calculation Method		
Baseline Energy Usage (kWh / yr)	=	Existing Computer Watts x Baseline Operating Hours / yr x 1 kW / 1000 Watts
Post- Retrofit Energy Usage (kWh / yr)	=	Existing Computer Watts x Hours with PC management / yr x 1 kW / 1000 Watts
Energy Savings	=	Baseline Energy Usage – Post-Retrofit

(kWh / yr)		Energy Usage

Maintenance Requirements

District staff should continuously evaluate the computers to ensure that each computer has the PC management software installed and deploy the software on the new computer whenever they are added.

Benefits

Simple to use

Energy savings

CRT Monitor Replacement

ECM Summary

This ECM will not only benefit the school district in energy savings, but it will also replace old-inefficient technology. Upgrading old, inefficient technology will make all the students and facility much more comfortable and effective while in the classrooms. The current CRT monitors are large and put off a tremendous amount of heat. The new LCD monitors are Energy Star Qualified.

Facilities Recommended for this Measure

Ocean Township High School

Ocean Township Intermediate School

Scope of Work

Remove and dispose existing CRT computer monitor

Provide new LCD computer monitors

Building	Quantity
Ocean Township High School	200
Ocean Township Intermediate School	46

Savings Methodology

In general, savings calculations for CRT monitor replacements are calculated using the following methodology:

Savings Calculation Method		
Baseline Energy Usage (kWh / yr)	=	Existing CRT monitor Watts x Operating Hours / yr x 1 kW / 1000 Watts

Post-Retrofit Energy Usage (kWh / yr)	=	Proposed Monitor Watts x Op. Hours/yr x 1 kW / 1000 Watts
Energy Savings (kWh / yr)	=	Baseline Energy Usage – Post-Retrofit Energy Usage

Maintenance Requirements

Follow manufacturers' recommendations for preventative maintenance.

Benefits

Improves overall system efficiency

Reduces maintenance and downtime costs

Potential capital cost avoidance

Eliminates aging equipment

Improves technology

Green Ribbon Schools

ECM Summary

Green Ribbon Schools is an award program that recognizes schools and individuals who accomplish great things in the areas of sustainability and health. The website also provides a free resource for sustainable projects and contests to engage students to learn about the environment.

In order to be considered for award of a Green Ribbon School, Ocean Township Schools must register on the Green Ribbon Schools website and publish a Results Page for at least one project in each of the 4 cornerstones. The cornerstones are defined as:

1. Environmentally-friendly Campus (Eco-Campus)
2. Nature Adventure
3. Health, Fitness and Nutrition
4. Natural Classrooms

Johnson Controls can help Ocean Township Schools achieve the project in the Eco-Campus and will support the district in any additional categories as necessary.

Facilities Recommended for this Measure

Wayside Elementary School

Scope of Work

- Johnson Controls will assist Ocean Township Schools with the application for the Green Ribbon School award – **the deadline for applications is June 15, 2013 for the 2012-2013 award year**
- Johnson Controls will publish the results of the Energy Savings Plan on the Results Page in order to obtain at least one project in the Eco-Campus cornerstone
- As necessary, Johnson Controls can support additional clubs, or projects throughout the District in order to apply for the Green Ribbon School award

Savings Methodology

Not applicable.

Maintenance Requirements

Not applicable.

Benefits

Public recognition of energy conservation efforts

Student engagement

Energy Star Rating

ECM Summary

The ENERGY STAR Program was created by the U.S. EPA and DOE as a way to encourage U.S. organizations to conserve energy, help accomplish the savings projects, and to publicize their efforts. Organizations and companies that join ENERGY STAR are Partners. Companies such as Johnson Controls and other ESCOs that assist Partners with their energy conservation efforts are Energy Service Providers.

When an organization becomes a Partner, they agree to:

Assess their energy management practices and energy costs and compare them to those of similar organizations.

Improve the energy performance of their facilities by adopting energy management best practices and undertaking cost effective energy conservation projects including the purchase of ENERGY STAR equipment where possible.

Strive for excellence and apply for the ENERGY STAR Label for Buildings to demonstrate superior building performance where applicable.

Communicate their success in these areas annually to the EPA.

In support of the Partner's efforts, EPA provides:

An account manager to handle the organization's questions.

Tools and resources to help Partners understand and utilize energy efficient technologies and strategies.

Recognition in national publications and public service announcements.

Reproducible materials to help the Partner communicate their success to employees and the public.

The ENERGY STAR Program is an excellent way for an organization to demonstrate that it is a good corporate citizen, and, is making a concerted effort and a commitment to reduce energy consumption and have a positive impact on the environment. As an Energy Service Provider, Johnson Controls acts as an advisor to the Partner and facilitates their involvement in ENERGY STAR at the level deemed appropriate by the customer.

The concept of sustainability – that success is measured in terms of the "triple bottom line" metrics of economic prosperity, environmental stewardship and social responsibility - is embedded into the very core of Johnson Controls' corporate vision and mission. Sustainable practices are profitable because they reduce risk, make businesses more efficient, productive, and technologically-advanced, while reducing environmental and social concerns.

Facilities Recommended for this Measure

Wayside Elementary School

Scope of Work

As an Energy Service Provider, Johnson Controls has assisted dozens of customers who are participating as Partners as follows:

Assisting the customer with the enrollment process.

Partnering with the customer to design and implement a successful and cost effective energy conservation program.

Providing project details, savings reports, and supporting utility data to EPA/DOE to illustrate the success of the Customer's energy conservation program.

Benchmarking facilities eligible for the ENERGY STAR Label, and, assisting with the application process.

Helping the customer obtain national, state, and local recognition and awards through the ENERGY STAR program.

Working with the customer to communicate their success story and award recognition to their employees, shareholders and the public at large.

Savings Methodology

Not applicable.

Maintenance Requirements

Not applicable.

Benefits

Public recognition of energy conservation efforts

Panoptix

ECM Summary

During the site visits and interviews with facility personnel, Johnson Controls engineers were able to determine that Ocean Township School District has a very comprehensive building automation system. Incorporating Panoptix into the energy strategy of the school district will allow various stakeholders to take an active role in energy management. At this time, Johnson Controls has not included this measure in the Base Case recommendations for the RFP Response. Once selected, Johnson Controls will work with the school district to determine the level of interest in the Panoptix solution; activities may include a Panoptix Demo as well as a technology workshop to address any other technology solutions.

Data-Driven Decisions = Informed Decisions

We are pleased to introduce our latest offering, Panoptix™, which is a complete building efficiency solution that combines the latest technology with Johnson Controls expertise and puts it all at your fingertips. It's an innovative new approach that enables building owners and operators to optimize building efficiency and performance more quickly, easily and cost effectively than ever before. ***Bring the right information to the right person at the right time.***

The Panoptix suite of applications combines powerful analytics with an easy-to-use, intuitive experience. Choose only the applications necessary to meet your needs. The Panoptix solution includes four key components:

An open technology platform that makes it easy to collect and manage data from disparate building systems and other data sources such as meter and weather data

A suite of cloud-hosted building efficiency applications that work with any building management system, including Metasys® by Johnson Controls

Live Guide™ on-line and telephone support, plus on-site building and energy services, to help customers improve energy and operational efficiency

An on-line Panoptix Connected Community of peers and experts committed to sharing best practices, news and resources

The comprehensive Panoptix approach is designed to help you achieve more from building assets. Whether you want to gain energy savings, reduce carbon footprint, or provide occupants with quality environments, Panoptix helps you do it quickly, easily and affordably.

Addressing Barriers to Smart Building Technology Implementation

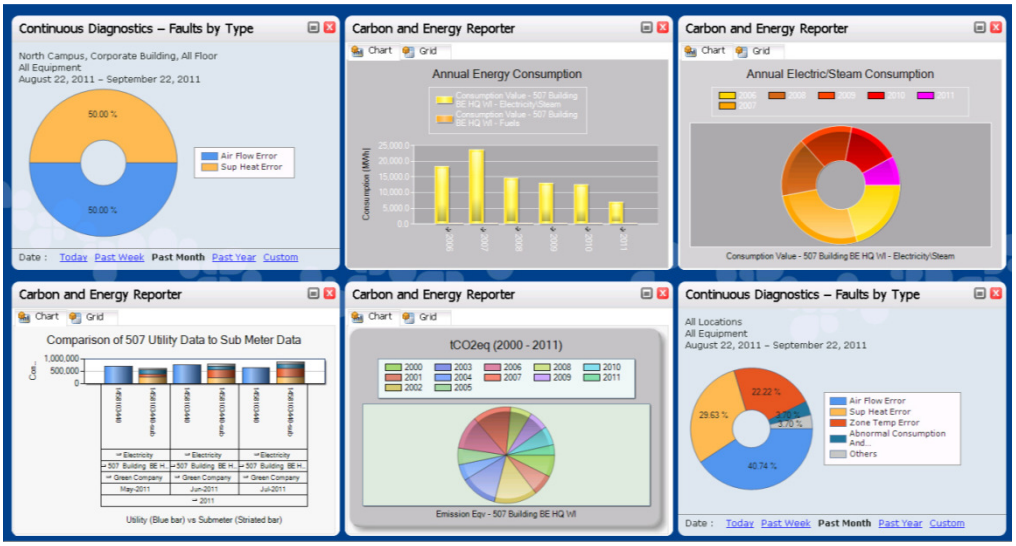
According to the 2011 International Data Corporation (IDC) Energy Insights Smart Building Investment Survey, 64 percent of respondents including building management decision makers cite cost as the number one hurdle to implementing smart building technology. Panoptix addresses this by expanding on existing building management systems, as well as eliminating the need for large initial capital investment with a Software as a Service (SaaS) subscription offering. Customers can further manage their investment by configuring their system to focus on their most critical priorities, such as energy usage and equipment performance, by choosing only the applications they require.

In addition to cost barriers, the IDC Energy Insights study also revealed that skill-set gaps made it difficult for facility managers to install and use smart building technology. Panoptix applications address this by presenting critical energy and performance information through an easy-to-use interface. The applications are built from advanced analytics and patented technology so customers benefit from the knowledge and experience of Johnson Controls Building Efficiency engineers.

Online Support and Service

Panoptix offers Live Guide™ support to help managers optimize their use of the applications. Live Guide support is complemented by a portfolio of building and energy services from Johnson Controls to help customers implement the operational improvements and energy-savings measures identified with the Panoptix applications. Additionally, the Panoptix Connected Community provides online connections to subject matter experts, industry thought leaders and colleagues to share best practices, news and tips on achieving building efficiency.

Today's Panoptix offerings are just the beginning of a new generation of building efficiency solutions and services from Johnson Controls.



Panoptix Global Operations: Dashboard

Savings Methodology

At this time, no savings have been claimed for this measure.

Maintenance Requirements

The Panoptix service must be renewed each year to maintain full functionality of the system.

Benefits

Improves overall system efficiency

Ease of use

Ability to quickly compile information for the entire District

Natural Gas Buses

ECM Summary

The price of diesel fuel has been escalating significantly and has remained volatile over the last several years. An alternative transportation fuel, natural gas, is abundant throughout the East Coast and is extremely inexpensive and clean-burning as compared to diesel fuel. Johnson Controls has completed a preliminary study of the potential to convert the school district's bus fleet from diesel fuel to compressed natural gas (CNG). Further study would need to be completed in order to identify a location for the bus fueling station as well as any grants or incentives available to help reduce the costs for the fleet conversion.

This solution requires further study however some of the highlights of improving the transportation infrastructure at the school district by converting to natural gas are below:

On average $6,500 fuel savings annually per bus

Converting the engines of the buses to natural gas engines will extend the life of the buses up to 10 years and will avoid the costs of replacing the buses with new diesel options

Facilities Recommended for this Measure

Ocean Township High School – Bus parking lot

Scope of Work

Johnson Controls will enter into a more detailed analysis during the installation of the energy conservation measures beginning in Sumer 2013. Another Investment Grade Energy Audit Agreement will be entered into between Johnson Controls and Ocean Township School District in order to provide for the detailed investigation and bid document creation for the fueling stating implementation and bus retrofit solution.

Johnson Controls will investigate the utilities in the existing Bus Yard in order to identify a potential location for a fueling station. This measure will depend on the natural gas capacity and availability at the existing Bus Yard as well as the electrical capacity at the location. The site selection will take into consideration location for fueling dispensers, compressors, tanks, dryers, as well as any upgrades that need to be made to the existing Bus Garage in order to meet applicable codes for a natural gas fueling station.

This conversion of the bus fleet entails the following:

Retrofit:

- Improve cooling system efficiency
- Engine cooler may be needed
- New valve seats, guides and seals
- New pistons and rings
- Alter engine compression ratio
- New camshaft
- Install ignition system
- Cylinder head modifications for new spark plugs
- Custom camshaft or crankshaft position sensors

Replacement:

- Replace existing diesel engines (DT-466) with new turbocharged natural-gas fired engines

Savings Methodology

Savings result from the reduce cost of natural gas fuel when compared with standard diesel fuel. Detailed energy savings can be found in the Appendix of this report.

Maintenance Requirements

The natural gas .buses require similar maintenance to diesel buses. Training for maintenance will be provided along with the retrofit/ replacement of the bus engines.

Benefits

Renewing bus fleet infrastructure (replacing/repairing old diesel engines during the conversion)

Significant cost savings (natural gas is less than one-third the price of diesel fuel)

There may be federal, state or corporate grants available to perform this work.

Positive environmental impact

Academy of Energy Education

ECM Summary

In combination with a Johnson Controls performance contract, The Academy of Energy Education program teaches individuals to modify their behavior which results in greater energy efficiency. The Academy is a proven way to deliver curriculum-enhancing programs that combine the study of exploratory science, energy and math with real world experience offering young students the opportunity to have fun while learning about energy in a wide variety of curriculum-enhancing packages. The Academy offers a comprehensive approach to energy education with a focus on sustainability.

In partnership with National Energy Foundation (NEF), a non-profit organization dedicated to the development, dissemination, and implementation of supplementary educational materials, programs, and courses, Johnson Controls developed the Academy of Energy Education. It is designed to educate and involve students in energy conservation at school and home.

The Academy training and materials go hand in hand to help educators efficiently use Academy materials and learn how they correlate with state/national standards. In addition to curriculum programs and training, Academy customers receive access to the Academy of Energy website. The website offers K12 curriculum, K12 and community awareness activities, training resources, blogs, competitions, and educational libraries.

Facilities Recommended for this Measure

Ocean Township High School

Ocean Township Intermediate School

Ocean Township Elementary School

Wanamassa Elementary School

Wayside Elementary School

Scope Narrative

Energy Action Technology, grades 9-12, teaches advanced energy concepts. Over 72 learning activities and seven Sources of Energy posters and corresponding Energists teach students about energy technologies and society as they begin to make the transition from school to work. The sources are: Coal, Oil, Natural Gas, Nuclear, Water, Renewable Energy, and Electrical Generation. Five full color technical posters teach about the Science of Flames, Petroleum Technology, Natural Gas Technology, Recycling Used Oil and Electrotechnology. The Energy Action Challenge gives students the opportunity to put into action at home what they have learned at school.

Solar Energy in Action, grades K-12, this interdisciplinary program includes learning activities for the elementary and secondary levels plus a supply kit that students may use to investigate solar energy and its uses. Additional supplemental instructional materials include the Renewable Energy Sources poster and accompanying Energist, the Electrical Generation poster and Energist, the Energy Basics CD, and the Eye Chart poster. This program can stand alone or serve as an excellent complement to Energy Fun, Energy Fundamentals, Energy Action Technology, or Energy Action Patrol.

Wind Energy in Action, grades 4-12, this interdisciplinary program includes learning activities for the elementary and secondary levels plus a kit which enables the teacher and students in cooperative learning groups to investigate the complexities of electrical generation while building and testing model wind turbines for their classroom. This program can stand alone or serve as an excellent complement to Energy Fundamentals, Energy Action Technology and Energy Action Patrol.

Career Exploration, grades 11-12, provides students with career related work experience while obtaining up to 40 hours of academic credit. The program allows students a superb opportunity to integrate classroom theory into the world of work, as well as providing career option exploration, practical experiences, new skill development, realistic perceptions of the work environment, and professional contacts. The externship experience is a vital component of any major technical level of instruction.

Externship, for college undergraduates, provides students with up to 100 hours of career-related work experience at a Johnson Controls office while obtaining three semester hours of college credit. This experience will offer students an on-site, hands-on opportunity to think about a career in the energy field. Whether a student has interest in technology, engineering, sales, administration, etc. this course will assist with workforce development decisions for the student and Johnson Controls.

Academy Geothermal: grades 4-12, is an interdisciplinary program that includes activities for the elementary and secondary levels. A supply kit is provided that includes materials to conduct the investigations that explore geothermal energy and its applications. Additional resources include the 23" X 35" Geothermal Energy Poster, an instructional poster that teachers about geothermal energy: history, technologies, residential and commercial applications, careers and the future of geothermal energy. Students will be guided through a series of activities. For example, the activity titled: "Inside Out Earth", describes the layers of the earth and some of the source for heat when using geothermal energy.

Academy Renewables: grades K-12, is an interdisciplinary collection of all three energy sources: solar, wind and geothermal. This comprehensive green energy collection provides curriculum and supplies to teach students all three of these important energy sources. The Academy Renewable Kit includes the complete Academy Solar, Academy Wind and Academy Geothermal Kits, and all of the activity supplies that support the inquiry based activities.

Academy Water: K-12, is a family of interdisciplinary curriculum materials designed to guide teachers through water basics, elementary water activities and then secondary activities that also include an exploration of technologies associated with water. The hydrologic cycle is explored as well as electric generation with water. Some of the activities are: Water in Your Own Backyard, Waterproof Savings, Building Water Turbines.

Scope of Work

Provide unlimited access to the Academy website via a user name and password.

Access is valid for 3 years from execution date of contract. After 3 years, access may be renewed annually as part of a Planned Service Agreement.

Academy of Energy Education Program website includes:

Classroom ready materials, plans and activities that align with K-12 curriculums

Activities for students, teachers and communities to encourage natural resource conservation

Teachers blog

Miscellaneous: laboratory materials, posters, training resources, competitions, educational libraries

Provide a virtual orientation meeting to the Academy website

Benefits

Curriculum Enhancement - Energy Education - Behavior Modification

Positive response for District parents

Section 5. Measurement and Verification

Measurement & Verification (M&V) Methodologies

This section contains a description of the types of Measurement and Verification (M&V) methodologies that Johnson Controls will use to guarantee the performance of this project.

They have been developed and defined by three independent authorities:

- International Performance Measurement and Verification Protocol (IPMVP)
- Federal Energy Management Program (FEMP)
- American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE) Guide 14P

There are four guarantee options that may be used to measure and verify the performance of a particular energy conservation measure. Each one is described below.

Option A – Partially Measured Retrofit Isolation

Savings are determined by field measurement of the key performance parameter(s) which define the energy use of the system affected by the ECM and estimate of other parameters.

Savings are determined through engineering calculations using short term or continuous pre and post-retrofit measurements of key operating parameter(s) and estimated values. Estimates can be based on historical data, manufacturer's specifications, or engineering judgment.

Option B – Retrofit Isolation with Ongoing Measurements

Savings are determined by field measurement of the energy use of the ECM-affected system, separate from the energy use of the rest of the facility.

Savings are determined through engineering calculations using short-term or continuous pre and post-retrofit measurements.

Option C – Whole Building Metering/Utility Bill Comparisons

Option C involves the use of utility meters or whole building sub-meters to assess the energy performance of a total building. Option C assesses the impact of any type of improvement measure, but not individually if more than one is applied to an energy meter. This option determines the collective savings of all improvement measures applied to the part of the facility monitored by the energy meter. Also, since whole building meters are used, savings reported under Option C include the impact of any other change made in facility energy use (positive or negative).

Option C may be used in cases where there is a high degree of interaction between installed improvement measures or between improvement measures and the rest of the building or the isolation and measurement of individual improvement measures is difficult or too costly.

This option is intended for projects where savings are expected to be large enough to be discernible from the random or unexplained energy variations that are normally found at the level of the whole facility meter. The larger the savings, or the smaller the unexplained variations in the baseline, the easier it will be to identify savings. Also, the longer the period of savings analysis after installing the improvement measure, the less significant is the impact of short-term unexplained variations. Typically, savings should be more than 20% of the baseline energy use if they are to be separated from the noise in the baseline data.

Periodic inspections should be made of all equipment and operations in the facility after the improvement measure installation. These inspections will identify changes from baseline conditions or intended operations. Accounting for changes (other than those caused by the improvement measures) is the major challenge associated with Option C-particularly when savings are to be monitored for long periods.

Savings are calculated through analysis of whole facility utility meter or sub-meter data using techniques from simple comparison to regression analysis.

Option D – Calibrated Simulation

Option D involves the use of computer simulation software to predict energy use. Such simulation models must be "calibrated" so that it predicts an energy use and demand pattern that reasonably matches actual utility consumption and demand data from either the base-year or a post-retrofit year.

Option D may be used to assess the performance of all improvement measures in a facility, akin to Option C. However, different from Option C, multiple runs of the simulation in Option D allow estimates of the savings attributable to each improvement measure within a multiple improvement measure project.

Option D may also be used to assess just the performance of individual systems within a facility, akin to Option A and B. In this case, the system's energy use must be isolated from that of the rest of the facility by appropriate meters.

Savings are calculated using energy use simulation models, calibrated with hourly or monthly utility billing data and/or end-use metering.

Selecting M&V Options for a Specific Project

The tailoring of your specific M&V option is based on the level of M&V precision required to obtain the desired accuracy level in the savings determination and is dependent on:

- The complexity of the Energy Conservation Measure
- The potential for changes in performance
- The measured savings value.

The challenge of the M&V plan is to balance three related elements:

- The cost of the M&V Plan
- Savings certainty
- The benefit of the particular conservation measure.

Savings can also be non-measured. If savings are non-measured, these savings are mutually agreed upon as achieved at substantial completion of the respective energy conservation measure and shall not be measured or monitored during the term of the performance contract.

Recommended Performance Verification Methods

Johnson Controls' performance verification methods are designed to provide the facility's administration with the level of M&V necessary to protect them from an under-performing energy conservation measure (ECM), yet have a minimal impact on the project's financial success.

The selection of the M&V methods to be used is based on the criteria as detailed by IPMVP and FEMP, and Johnson Controls' experience with hundreds of successful performance contracts in the federal, state, and private sectors. Following is a table illustrating how the savings of the major energy conservation measures proposed for this project will be verified.

Ocean Township Measurement and Verification Plan		
ECM Description	**M&V Method - Summary**	**Detail of M&V Methodology**
Hot Water Boiler Replacement	**Option A:** Savings are from the increased efficiency of the new boilers.	**Pre M&V:** Manufacturer's data and operation schedule of the existing boilers will be collected during the site audit to verify the baseline heating gas consumption. The efficiency of the existing boilers will be determined with the combustion test. **Post M&V:** The new boilers will be inspected to ensure they are in place and operating as intended. The combustion test will be performed to determine the efficiency of the new boilers. **Energy Savings:** Savings are from the increased efficiency of the new boilers.
Variable Flow Heating Hot Water Pumping (Motor Replacement)	**Option A:** Savings are from installing VFD on existing hot water pumps.	**Pre M&V:** Accepted engineering practices / building simulations are used to calculate energy consumption baselines. The kW of the hot water pumps was measured. All results will be calibrated. **Post M&V:** Once the installation is completed, the amp loggers will be installed for one time to verify if the VFD is working properly. **Energy Savings:** Savings are from installing VFD on existing hot water pumps.
Steam Trap Replacements	**Option A:** Savings are from replacing failed steam traps and/or fixing steam trap leakage.	**Pre M&V:** Infrared survey will be implemented to determine the location, quantity and size of the steam traps failed and working. The information will be used to determine the steam consumption baseline of steam traps. **Post M&V:** Once the installation is completed, the final as-built will be used to verify if the failed traps and/or leaking traps are replaced and/or fixed. The customer is recommended to implement an annual preventive maintenance program on steam traps. **Energy Savings:** Savings are from replacing failed steam traps and/or fixing steam trap leakage.
Pipe Insulation / Blankets	**Non-Measured:** Savings are from installing insulation and insulation blankets.	**Pre M&V:** The surface temperature and the size of the space requiring insulation installation will be estimated during the field audit. **Post M&V:** Following installation, the size and the surface temperature of the space where the insulation is installed will be verified. **Energy Savings:** Savings are from installing insulation blankets.

Ocean Township Measurement and Verification Plan		
ECM Description	**M&V Method - Summary**	**Detail of M&V Methodology**
HVAC Filter Upgrades	**Non-Measured**: Savings are from replacing the existing panel filters.	**Pre M&V:** Existing CFM and fan kW will be taken on applicable equipment to determine existing energy use. **Post M&V:** Savings will be calculated based on manufacturer specifications for filter pressure drop and calculations reducing outdoor air requirement for the space. **Energy Savings:** Savings are from the reduced energy consumption of the heating and cooling system based on reduced outdoor air ventilation.
Addition of Cooling to Schools	**Non-Measured**: Savings are from adding additional cooling to the space.	**Pre M&V:** Under existing conditions the spaces are not cooled. The manufacturer efficiency of the new equipment will be used in the eQUEST model to determine energy consumption. **Post M&V:** Savings will be calculated based on manufacturer specifications for the efficiency and the agreed upon schedule for the spaces. **Energy Savings:** Savings are from adding cooling to the space.
Demand Control Ventilation	**Option B:** Savings are from the reduced energy consumption of the heating and cooling system based on the CO2 level.	**Pre M&V:** Accepted engineering practices / building simulations are used to calculate energy consumption baselines. The motor loggers were installed to determine the motor operation schedule. The power readings were taken on a sample of RTUs. **Post M&V:** Various control points within the building management system will be trended and/or totalized. This data will be used to verify that the demand control ventilation strategy is in place and functioning as intended. **Energy Savings:** Savings are from the reduced energy consumption of the heating and cooling system based on the CO2 level.
Boiler Controllers	**Non-Measured:** Savings are from the optimized on and off cycles of the burner ignition	**Pre M&V:** Manufacturer's data and existing operating parameters will be collected on the boilers. **Post M&V:** The boiler controllers will be inspected following installation to verify proper operation **Energy Savings:** Savings are from the optimized on and off cycles of the burner ignition.
HVAC System Commissioning	**Option B:** Savings are from implementing control strategies.	**Pre M&V:** Accepted engineering practices / building simulations will be used to calculate energy consumption baselines. Operating parameters of the system will be verified through BAS system. The temperature loggers and motor loggers will be installed to determine the space temperature and motor operation schedule. The power readings will be taken on a sample of motors. **Post M&V:** Various control points within the building management system will be trended and/or totalized. This data will be used to verify that all control strategies are in place and functioning as intended. **Energy Savings:** Savings are from implementing control strategies.
Solar PV	**Option B:** Savings are from the electricity generated from the PV system.	**Pre M&V:** The expected sunshine at the location is studied. The potential electric load to be offset will be verified through site audit and utility bills. **Post M&V:** The amount of electricity produced from the PV system will be collected from the PV panel and used to verify the savings. Annual incident radiation will be tracked for saving normalization purposes. **Energy Savings:** Savings are from the electricity generated from the PV system.

Ocean Township Measurement and Verification Plan		
ECM Description	**M&V Method - Summary**	**Detail of M&V Methodology**
Exterior Building Lighting	**Non-Measured:** Savings are from installing high efficient lighting fixtures.	**Pre M&V:** The quantity, watt and operation schedule of existing exterior lighting fixtures will be collected during the audit. **Post M&V:** Once the installation is completed, the new exterior lighting fixtures will be inspected to ensure they are in place and operational. **Energy Savings:** Savings are from installing high efficient lighting fixtures.
Interior Lighting Retrofits	**Option A:** One time pre and post-retrofit kW measurement. Burn hours determined using logger data collected in the field.	**Pre M&V:** Lighting power readings were taken on a sample of lighting fixtures. Lighting burn hours were measured through the use of light loggers. The lighting burn hours will be the same for baseline and post-installation conditions. **Post M&V:** Lighting power readings will be taken on a sample of lighting fixtures. Measurements will occur once at the outset of the agreement. **Energy Savings:** Energy savings will be calculated using the actual measured wattage reduction and measured burn-hours.
Interior LED Lighting	**Non-Measured:** Savings are from installing high efficient lamps.	**Pre M&V:** The quantity, watt and operation schedule of existing track lighting fixtures will be collected during the audit. **Post M&V:** Once the installation is completed, the new LED track lighting fixtures will be inspected to ensure they are in place and operational. **Energy Savings:** Savings are from installing high efficient lamps.
Daylight Harvesting	**Non-Measured:** Savings are from reduced lighting fixture consumption.	**Pre M&V:** The quantity, watt and operation schedule of the lighting fixtures where the daylight harvesting system will be installed are collected during the audit. **Post M&V:** Once the installation is completed, the daylight harvesting system will be inspected to ensure it is in place and operational. **Energy Savings:** Savings are from reduced lighting fixture consumption.
Lighting Occupancy Controls	**Option A:** Savings are from the reduced operating hours of the lighting fixtures.	**Pre M&V:** Lighting power readings were taken on a sample of lighting fixtures. Lighting burn hours were measured through the use of light loggers. The lighting burn hours will be the same for baseline and post-installation conditions. **Post M&V:** Once the installation is completed, the sensors will be inspected to ensure proper operation. **Energy Savings:** Savings are from the reduced operating hours of the lighting fixtures.
Controls for Plug-in Equipment	**Non-Measured**: Savings are from the reduced operating hours of the plugged in equipment.	**Pre M&V:** Nameplate data will be used to determine the total kW of plugged in equipment. **Post M&V:** Once the installation is complete, the sensors will be inspected to ensure proper operation. **Energy Savings:** Savings are from the reduced operating hours of the plugged in equipment.
Kitchen Equipment Replacement (ENERGY STAR)	**Option A:** Savings are from the reduced electric consumption by replacing equipment with ENERGY STAR equipment.	**Pre M&V:** Manufacturer's data and operating parameters of the equipment will be collected during the field audit. Loggers will be installed if applicable. **Post M&V:** New equipment will be inspected following installation to ensure proper operation. **Energy Savings:** Savings are from the reduced electric consumption by replacing the kitchen equipment.

Ocean Township Measurement and Verification Plan		
ECM Description	**M&V Method - Summary**	**Detail of M&V Methodology**
Ice Machine Meltwater Heat-exchanger	**Non-Measured**: Savings are from reducing the cooling load of the incoming cold water to the ice machines.	**Pre M&V:** Manufacturer's information regarding ice production, water consumption, and electric consumption will be used as the baseline data. **Post M&V:** Savings will be calculated based on manufacturer specifications for the efficiency of the heat exchanger. **Energy Savings:** Savings are from reducing the cooling load of the incoming cold water to the ice machines.
Kitchen Hood Controls	**Non-Measured:** Baseline and post-retrofit power consumption determined through field audit data.	**Pre M&V:** Manufacturer's data and mechanical drawings will be collected on the exhaust fans and make up air system during the site audit. **Post M&V:** Once the installation is completed, the system will be inspected to ensure proper operation. **Energy Savings:** Savings are from the reduced operation time of the exhaust fans and make up air system.
Walk-in Box Upgrade	**Non-Measured:** Savings are from the reduced electric consumption of freezer and refrigerator.	**Pre M&V:** Manufacturer's data and operating parameters will be collected on the freezer and refrigerator. **Post M&V:** Once the installation is completed, the walk-in box control system will be inspected to ensure proper operation. **Energy Savings:** Savings are from the reduced electric consumption of freezer and refrigerator.
Transformer Replacement	**Option A:** Savings are from installing high efficiency transformers.	**Pre M&V:** Manufacturer's data and operating parameters will be collected on the existing transformers. The efficiency of the existing transformers will be determined through the test. **Post M&V:** Once the installation is completed, the new transformers will be inspected to verify if they are working properly. The efficiency of the new transformers will be determined through the test. **Energy Savings:** Savings are from reduced losses from installing high efficiency transformers.
Vending Miser	**Non-Measured:** Post retrofit consumption determined through reduced operating hours of vending machines.	**Pre M&V:** The total number of vending machines will be verified during the audit and the operating hours of the machines will be estimated based on vending machines operating 24 hours per day. **Post M&V:** A sample of Vending Misers will be inspected to ensure the devices are in place and operational. **Energy Savings:** Savings for the Vending Misers will be determined through a reduction of machine run hours.
High Efficiency Electric Hand Dryer Installation	**Non-Measured**: Savings are from the reduced electric consumption by replacing equipment with more efficient equipment.	**Pre M&V:** Manufacturer's data and operating parameters of the equipment will be collected during the field audit. **Post M&V:** New equipment will be inspected following installation to ensure proper operation. **Energy Savings:** Savings are from the reduced electric consumption by replacing the electric hand dryers.

Ocean Township Measurement and Verification Plan		
ECM Description	**M&V Method - Summary**	**Detail of M&V Methodology**
Replace Teacher Room Refrigerators with ENERGY STAR Models	**Option A:** Savings are from the reduced electric consumption by replacing equipment with ENERGY STAR equipment.	**Pre M&V:** Manufacturer's data and operating parameters of the equipment will be collected during the field audit. Loggers will be installed if applicable. **Post M&V:** New equipment will be inspected following installation to ensure proper operation. Loggers will be installed if applicable. **Energy Savings:** Savings are from the reduced electric consumption by replacing the refrigerators.
Window Replacement	**Non-Measured:** Savings are from installing new windows.	**Pre M&V:** The size and property of the existing window will be determined from the field audit. **Post M&V:** Once the installation is completed, the size and property of the new window will be verified via as-built and manufacturer cut sheet. **Energy Savings:** Savings are from installing new windows.
Infiltration Reduction	**Option A:** Savings are from the improved building envelope.	**Pre M&V:** The size of the cracks and joint deficiencies were verified during the field audit. **Post M&V:** Once the installation is completed, the areas identified for infiltration reduction will be verified to be completed through the final as-built. **Energy Savings:** Savings are from the improved building envelope.
Window Film	**Non-Measured:** Savings are from installing new window film.	**Pre M&V:** The size and property of the existing window will be determined from the field audit. **Post M&V:** Once the installation is completed, the size and property of the new window film will be verified via as-built and manufacturer cut sheet. **Energy Savings:** Savings are from installing new window film.
Domestic Hot Water Fuel Conversion	**Non-Measured**: Savings are from lower gas heating cost.	**Pre M&V:** Manufacturer's data and existing operating parameters will be collected on the DHW heater. **Post M&V:** The new DHW heater will be inspected following installation to verify proper operation. The nameplate data will be used to determine the gas heating consumption. **Energy Savings:** Savings are from lower gas heating cost.
Demand Response	**Non-Measured:** Savings are from participating in the Demand Response program of PJM by lowering down the peak load with load shedding strategies and/or switching to generators, if applicable.	**Pre M&V:** Johnson Controls will collect the Peak Load Contribution (PLC) of the school district and subtract permanent load reductions associated with the Performance Contract project to determine the amount of the load that can be dropped by switching to electric generators and/or implementing load shedding strategies. **Post M&V:** Johnson Controls will use Gridconnect Platform to determine account/building customer average baseline demand profile (kW). Johnson Controls will also use the Gridconnect platform to measure and verify load drop against actual participation and or actual load testing. **Energy Savings:** Savings are from participating in the Demand Response program of PJM by lowering down the peak load with load shedding strategies and/or switching to generators, if applicable.

Ocean Township Measurement and Verification Plan		
ECM Description	**M&V Method - Summary**	**Detail of M&V Methodology**
PC Computer Management System	**Option B:** Baseline and post-retrofit computer operating hours are tracked through the software. This data along with power readings in different modes will be used to calculate the savings.	**Pre M&V:** The power readings will be measured on a sample of computers operating in different modes (stand by, sleep, etc.). **Post M&V:** The pre and post retrofit computer operating hours in different mode will be tracked through the software. Post retrofit power readings will be measured for different computer operating modes on a sample of computers. **Energy Savings:** Based on the difference in actual computer operating hours, power draw and operational profile energy savings will be calculated.
Replace CRT Monitors	**Option A:** Savings are from the reduced electric consumption by replacing equipment with more efficient equipment.	**Pre M&V:** Manufacturer's data and operating parameters of the equipment will be collected during the field audit. Loggers will be installed if applicable. **Post M&V:** New equipment will be inspected following installation to ensure proper operation. Loggers will be installed if applicable. **Energy Savings:** Savings are from the reduced electric consumption by replacing the computer monitors.

Discussion of ESPE Scope of Work

Johnson Controls will provide the M&V services set forth below in connection with the Assured Performance Guarantee.

1. During the installation period, a Johnson Controls Energy Solution Performance Engineer will track measured project benefits. We will report the measured project benefits achieved during the installation period, as well as any non-measured project benefits applicable to the installation period, to the District within 60 days of the commencement of the guarantee term.

2. Within 60 days of each anniversary of the commencement of the guarantee term, Johnson Controls will provide Ocean Township Board of Education with an annual report containing:

An executive overview of the project's performance and project benefits achieved to date

A summary analysis of the Measured Project Benefits accounting

Depending on the M&V option, a detailed analysis of the measured project benefits calculations.

3. During the Guarantee Term, a Johnson Controls Energy Solution Performance Engineer will monitor the on-going performance of the improvement measures, as specified in this agreement, to determine whether anticipated measured project benefits are being achieved. In this regard, the Energy Solution Performance Engineer will periodically assist the District, on-site or remotely, with respect to the following activities:

Review of information furnished by the district from the facility management system to confirm that control strategies are in place and functioning

Advise the District's designated personnel of any performance deficiencies based on such information

Coordinate with the District's designated personnel to address any performance deficiencies that affect the realization of measured project benefits

Inform the District of opportunities to further enhance project performance and of opportunities for the implementation of additional Improvement measures

4. For specified Improvement Measures utilizing an "Option A" M&V protocol, Johnson Controls will:

Conduct pre and post installation measurements required under this agreement

Confirm the building management system employs the control strategies and set points specified in this agreement

Analyze actual as-built information and adjust the baseline and/or Measured Project Benefits to conform to actual installation conditions (e.g., final lighting and water benefits calculations will be determined from the as-built information to reflect the actual mix of retrofits encountered during installation).

5. For specified improvement measures utilizing an "Option B" M&V protocol, Johnson Controls will:

Confirm that the appropriate metering and data points required to track the variables associated with the applicable improvement measures' benefits calculation formulas are established

Set up appropriate data capture systems (e.g., trend and totalization data on the facility management system) necessary to track and report measured project benefits for the applicable improvement measure.

Section 6. Customer Support

Maintenance Impacts/ On-Going Service

New pieces of equipment that are installed as part of the ESIP project will be provided with the standard manufacturer warranty. Once installation of the equipment is complete, the remaining warranty period will be transferred to Ocean Township School District; any warranty issues will be handled directly with the equipment manufacturer rather than with Johnson Controls.

The installation of the recommended measures will reduce the amount of emergency maintenance required by the district through the installation of new equipment; however, preventative maintenance is still required in order to ensure the correct operation of the equipment for the expected lifetime. A service agreement cannot be included as part of this project per the New Jersey Local Finance Notice 2009-11. Once the scope is finalized and bids are received, Johnson Controls will assist the District in preparing bids for any preventative service agreement that is felt necessary for the new equipment. The service agreement will cover recommended maintenance per each equipment manufacturer. Training on the proper maintenance and operation of each piece of equipment has also been included as part of the ESIP project which will allow the District to complete the majority of maintenance and repair in-house in order to utilize District resources.

Design and Compliance Issues

As part of the bidding process and ESP development, Johnson Controls is working with a State of New Jersey registered professional engineer to ensure that all design and compliance issues have been encompassed in the ESP and that any recommended measures will meet all applicable codes. These services have been included as part of the ESP development.

Customer Risks

The equipment recommended for replacement has been evaluated and compared to the ASHRAE rated life. The boiler at Ocean Township Intermediate School is nearing the rated life as published by ASHRAE and could fail at any time. If it is not replaced as part of this project, the replacement could result in a large capital outlay in the near future.

Finally, the HVAC system at Ocean Township Intermediate School creates an unsatisfactory humidity condition in the school which results in emergency dehumidification being used only after alarms are detected. During the Energy Savings Plan development, the HVAC and control systems at this school were evaluated to determine if a feasible solution exists to control the humidity within the space. If a long term solution is not obtained for the humidity levels in the Intermediate School, the District will be at risk for mold growth and unsatisfactory educational environments.

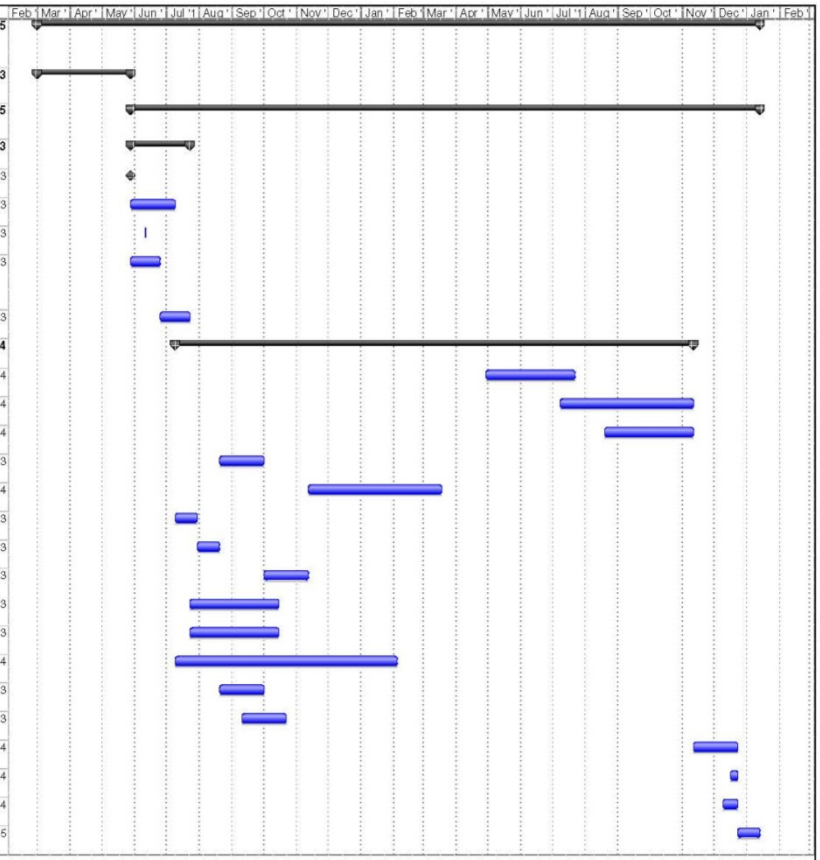
Section 7: Implementation Schedule

A preliminary installation schedule for the measures implemented as part of the ESP is included below to provide a reasonable expectation for the timeline of construction. Once final bids are received and financing of the project is complete, the installation will be finalized in much greater detail and reviewed with the team from Ocean Township School District to ensure agreement. A high level review of the next steps in the process is shown below as well as the estimated time frame to complete each step:

- Accept Energy Savings Plan – April 16, 2013
- Complete Board of Public Review of Energy Savings Plan – 30 days
- Complete Third Party Engineering Review of Energy Savings Plan – 2 weeks
- Approval resolution to contract with Johnson Controls: May School Board Meeting
- Financing of project: 30 days
- Installation – June 2013 – August 2014
- Maintenance: On-going

The project plan on the following page details the Installation Phase schedule.

ID	Task Name	Duration	Start	Finish
1	**Township of Ocean BOE**	7.25 days	Fri 3/1/13	Tue 1/13/15
2	**Phase 1: Energy Savings Plan**	2.25 days	Fri 3/1/13	Tue 5/28/13
49	**Phase 2: Project Installation**	425 days	Tue 5/28/13	Tue 1/13/15
50	**Pre-Construction Planning**	40 days	Tue 5/28/13	Tue 7/23/13
51	Contract Signing	0 days	Tue 5/28/13	Tue 5/28/13
52	Mobilization	30 days	Tue 5/28/13	Tue 7/9/13
53	Construction Kick-off Meeting	4 hrs	Tue 6/11/13	Tue 6/11/13
54	Final Design and Bid Package Preparation for Sub-contracted Measures	1 mon	Tue 5/28/13	Tue 6/25/13
55	Bidding for Sub-contracted Measures	1 mon	Tue 6/25/13	Tue 7/23/13
56	**ECM Installation**	350 days	Tue 7/9/13	Tue 11/11/14
57	Boiler Plant Measures	60 days	Tue 4/29/14	Tue 7/22/14
58	HVAC Systems	90 days	Tue 7/8/14	Tue 11/11/14
59	Building Automation	60 days	Tue 8/19/14	Tue 11/11/14
60	Building Envelope	30 days	Tue 8/20/13	Tue 10/1/13
61	Electrical Systems	90 days	Tue 11/12/13	Tue 3/18/14
62	Grants, Incentives & Revenue Generation	15 days	Tue 7/9/13	Tue 7/30/13
63	Information Technologies	15 days	Tue 7/30/13	Tue 8/20/13
64	Kitchen Equipment and Systems	30 days	Tue 10/1/13	Tue 11/12/13
65	Lighting System Upgrades	60 days	Tue 7/23/13	Tue 10/15/13
66	Lighting Controls	60 days	Tue 7/23/13	Tue 10/15/13
67	Renewable Solutions	150 days	Tue 7/9/13	Tue 2/4/14
68	Water System and Controls	30 days	Tue 8/20/13	Tue 10/1/13
69	Academy of Energy Education	30 days	Tue 9/10/13	Tue 10/22/13
70	Punch List Items	30 days	Tue 11/11/14	Tue 12/23/14
71	Equipment Initial Training	5 days	Tue 12/16/14	Tue 12/23/14
72	System Commissioning	2 wks	Tue 12/9/14	Tue 12/23/14
73	Project Close out	15 days	Tue 12/23/14	Tue 1/13/15



Project: Project Schedule for RFP_MA
Date: Mon 1/28/13

Task | Summary | Rolled Up Progress | Project Summary
Progress | Rolled Up Task | Split | Group By Summary
Milestone | Rolled Up Milestone | External Tasks | Deadline

Section 8. Sample Energy Performance Contract

Appendix 1. Energy Conservation Measures Investigated but not recommended at this time

Steam Boiler Replacement

The existing steam boilers located at the Administration Building and Wanamassa Elementary School were evaluated for replacement as part of the Energy Savings Plan. Upon reviewing the estimated cost and savings for the replacement of this equipment the payback proved to be well beyond the term of the project. These boilers have roughly 10 – 25 remaining years until the ASHRAE rated service life and are not reported to require significant repairs throughout the year.

Hot Water Boiler Replacement

There is an older hot water boiler located at Ocean Township Elementary School which provides back-up heating and heat only during design days which was investigated for replacement. Due to the limited hours of use this boiler does not have a payback within the term of this project. It was reported that the two newer AERCO boilers can handle the load of the building throughout most of the year and the other boiler is used sparingly. As a result this boiler will not be replaced through this project.

Chiller Replacement

Ocean Township Intermediate School is the only building in the district with a chilled water system. The existing system contains five (5) remote condensing air-cooled chillers which were installed in 2005. These chillers were observed to have adaptive control and are in good condition. Although, these chillers utilize older refrigerant (R-22) they are in good condition and well maintained. These chillers should be re-investigated as they approach the end of their rated life.

Thermal Storage System Installation

The installation of thermal storage systems were evaluated for each of the school buildings throughout the District, but were ultimately ruled out for several reasons. Namely, the current piping configuration throughout the school is for heating hot water or steam only which is too small for the necessary chilled water flow to provide adequate cooling to the space. Secondly, the electrical capacity at many of the schools will not support the installation of the chilled water infrastructure necessary for the ice storage system. Lastly, only the Intermediate School is utilized for summer programs and requires cooling; the remaining buildings are only used for cleaning purposes. Because of the newer equipment at Ocean Township Intermediate School, the installation of the ice storage system is not recommended.

Variable Flow Chilled Water Pumping

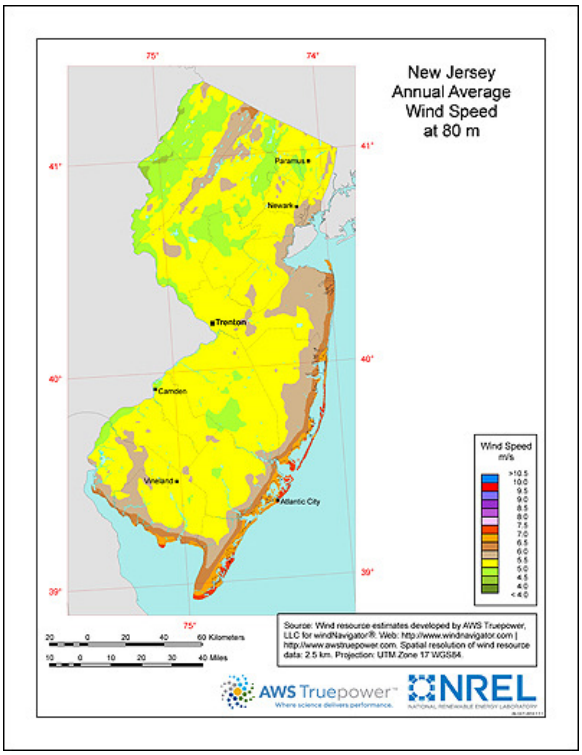
The pumps serving the chilled water loops in the rooftop mechanical room were evaluated for the installation of variable speed control in order to vary the flow of chilled water to the terminal equipment. Because of the size of these pumps and motors, the payback of the retrofit is outside of the term of this project.

Ground Source Heat Pump

The installation of ground source heat pump systems at Ocean Township High School, Elementary School, and Wanamassa Elementary School were evaluated in order to add cooling to the schools as well as upgrade the heating equipment at all of the buildings. These systems proved too costly to implement and had a payback that is well beyond the term of this project. Even with state incentives, the economic aspects of this retrofit were not feasible. In addition, the hot water central plants for these buildings contain operational equipment which is roughly mid-way through the ASHRAE rated life; replacing this equipment now would not take full advantage of the previous capital investment.

Wind Turbine Installation

A large scale wind turbine was investigated for Ocean Township School District due to the proximity of the District to the New Jersey coastline where wind speeds are greater than the rest of the state. Areas with annual average wind speeds around 6.5 meters per second and greater at 80-m height are generally considered to have a resource suitable for wind development. The average annual wind speed for Oakhurst appears to be just below 6.0 meters per second which rules out the installation of a wind turbine for power production. The population density throughout Ocean Township also makes the installation of a wind turbine challenging.



Solar Thermal Domestic Hot Water Installation

Solar thermal domestic hot water systems utilize the suns energy to heat water for sinks and shower purposes. These systems have the greatest effect during the summer months when there is extending periods of sunlight and more domestic water can be heated, because of the usage of the schools during the summer, there is not enough domestic hot water load to warrant the installation of a solar thermal heating system.

Domestic Hot Water Generator Replacement

The domestic hot water heaters were evaluated for replacement as part of this project. Several of the hot water heaters used for domestic hot water are at or are nearing their rated life and could be replaced. The payback of this equipment replacement is beyond the term of the project and is therefore not recommended for inclusion at this time. As the domestic hot water heaters exceed their rated life and begin to fail and leak, the District staff can replace the equipment on an as-needed basis.

Domestic Water Conservation

During the site investigations several domestic water fixtures were noted as standard flow, specifically sink faucet aerators. Ocean Township Schools replaces these fixtures as part of their maintenance procedures and will address any remaining faucets as a maintenance activity throughout the year.

Cogeneration Installation

Cogeneration equipment utilizes natural gas to produce electricity on site with the waste heat used for heating hot water typically. This measure is generally considered when a boiler replacement is recommended because the heat

can be used for hot water. In the case of Ocean Township Schools, the boiler is being recommended for replacement at Ocean Township Intermediate School; however, cogeneration is not a viable option because of the current configuration of the heating hot water, chilled water, and domestic hot water for the building. The hot water boilers at the Intermediate School are turned off during the summer and the piping is utilized for chilled water which restricts the use of the waste heat from the cogeneration equipment. An option would be to install valves and additional piping to tie the waste heat of the cogeneration unit to the domestic hot water system which has minimal usage during the summer. The added cost of the piping, generating equipment, and the limited amount of use for the waste heat outweighs the advantage of the New Jersey utility incentives available for cogeneration or the ability to extend the term of the ESIP project to 20 years instead of the standard 15 year term.

Football Field Lighting Replacement

Field lighting at football fields is typically accomplished through pole mounted metal halide lights which are expensive to maintain and consume excessive amounts of energy when on. Newer football field lighting is focused on concentrating the lighting where it is needed most and can provide the same, or better, lighting levels with fewer fixtures than older lighting. The current operating hours of the football field is limited to nine (9) home games a year which is roughly 40 annual operating hours. Due to the low use of the field, this project has an excessive payback term.

Irrigation System Installation

The school district currently utilizes city water for the irrigation of the High School Fields. An existing capital project is underway to install a new well to serve the irrigation of the football field. Once the well is installed, there will be limited city water usage for the irrigation and the payback of the irrigation system will be eliminated.

Projector Replacement & Control

During the RFP Response and initial phases of the Energy Saving Plan development, Johnson Controls evaluated the replacement of the projectors throughout the school with newer, networkable projectors. During the detailed investigation and discussion with IT directors, it was determined that 150 of the projectors were replaced this past summer and more were planned for the upcoming summer. The new projectors already utilize less energy than the equipment observed during the RFP Response. In addition, the control of the projectors seemed to be very good, the majority of projectors were off when Johnson Controls employees were observing the sites after hours.

Appendix 2. Detailed Demand Response Analysis

Appendix 3. Energy Savings Calculations

Energy savings are available electronically due to the size of the files.

Appendix 4. Field Measurements

Field measurements are available electronically due to the size of the files.

Appendix 5. Recommended Project

The following items represent the cost breakouts for the recommended project.

ECM #	ECM Description	Total Estimated Price	Annual Utility Savings without Escalation	Simple Payback	Installation Plan	Recommended For Installation
7	Addition of Cooling to Cafeteria - Ocean Township High School	$340,015	($2,400)	N/A	JCI Implement	X
8	Addition of Cooling to Gym - Ocean Township High School	$341,575	($3,157)	N/A	JCI Implement	X
9	Addition of Cooling to Cafeteria - Ocean Township Elementary School	$344,792	($3,210)	N/A	JCI Implement	X
10	Addition of Cooling to Gym - Ocean Township Elementary School	$288,004	($2,762)	N/A	JCI Implement	X
11	Addition of Cooling to Gym - Wanamassa Elementary School	$136,507	($3,281)	N/A	JCI Implement	X
12	Addition of Cooling to Gym & Cafeteria - Wayside Elementary School	$311,182	($4,499)	N/A	JCI Implement	X
19	Install Humidity Control in Cafetorium - Ocean Township Intermediate School	$11,903	($2,866)	N/A	JCI Implement	X
21	Pipe Insulation / Blankets - Administration Building	$45,565	$3,528	12.9	JCI Implement	X
22	Pipe Insulation / Blankets - Ocean Township High School	$84,671	$7,818	10.8	JCI Implement	X
25	Pipe Insulation / Blankets - Wanamassa Elementary School	$79,741	$9,118	8.7	JCI Implement	X
26	Pipe Insulation / Blankets - Wayside Elementary School	$53,893	$3,843	14.0	JCI Implement	X
32	Building Automation Controls Upgrades - Central Plant - Administration Building	$43,900	$6,252	7.0	JCI Implement	X
36	Demand Control Ventilation - Ocean Township High School	$26,710	$13,282	2.0	JCI Implement	X
37	Demand Control Ventilation - Ocean Township Elementary School	$6,256	$3,015	2.1	JCI Implement	X
38	Demand Control Ventilation - Ocean Township Intermediate School	$20,775	$10,144	2.0	JCI Implement	X
39	Demand Control Ventilation - Wanamassa Elementary School	$3,208	$1,028	3.1	JCI Implement	X
40	Demand Control Ventilation - Wayside Elementary School	$8,903	$1,023	8.7	JCI Implement	X
41	Boiler Controllers - Administration Building	$17,268	$875	19.7	JCI Implement	X
42	Boiler Controllers - Ocean	$24,126	$3,529	6.8	JCI Implement	X

ECM #	ECM Description	Total Estimated Price	Annual Utility Savings without Escalation	Simple Payback	Installation Plan	Recommended For Installation
	Township High School					
43	Boiler Controllers - Ocean Township Intermediate School	$16,084	$4,263	3.8	JCI Implement	X
44	Boiler Controllers - Wanamassa Elementary School	$17,268	$2,043	8.5	JCI Implement	X
45	Boiler Controllers - Wayside Elementary School	$24,126	$1,337	18.0	JCI Implement	X
46	HVAC System Commissioning - Administration Building	$6,417	$0	N/A	JCI Implement	X
47	HVAC System Commissioning - Ocean Township High School	$15,721	$23,905	0.7	JCI Implement	X
48	HVAC System Commissioning - Ocean Township Elementary School	$8,663	$6,835	1.3	JCI Implement	X
49	HVAC System Commissioning - Ocean Township Intermediate School	$15,721	$5,177	3.0	JCI Implement	X
50	HVAC System Commissioning - Wanamassa Elementary School	$8,663	$3,090	2.8	JCI Implement	X
51	HVAC System Commissioning - Wayside Elementary School	$8,663	$9,275	0.9	JCI Implement	X
52	Solar PV - Ocean Township High School	$369,853	$17,648	21.0	JCI Implement	X
53	Solar PV - Ocean Township Intermediate School	$67,280	$26,056	2.6	JCI Implement	X
54	Exterior Building Lighting - Administration Building	$5,057	$654	7.7	Public Bidding for Subcontractors	X
55	Exterior Building Lighting - Ocean Township High School	$60,625	$4,235	14.3	Public Bidding for Subcontractors	X
56	Exterior Building Lighting - Ocean Township Elementary School	$44,891	$2,795	16.1	Public Bidding for Subcontractors	X
57	Exterior Building Lighting - Ocean Township Intermediate School	$101,981	$7,774	13.1	Public Bidding for Subcontractors	X
58	Exterior Building Lighting - Wanamassa Elementary School	$30,235	$2,765	10.9	Public Bidding for Subcontractors	X
59	Exterior Building Lighting - Wayside Elementary School	$18,307	$1,966	9.3	Public Bidding for Subcontractors	X
60	Interior Lighting Retrofits - Administration Building	$34,651	$3,034	11.4	Public Bidding for	X

ECM #	ECM Description	Total Estimated Price	Annual Utility Savings without Escalation	Simple Payback	Installation Plan	Recommended For Installation
					Subcontractors	
66	Interior LED Lighting - Ocean Township Intermediate School	$2,100	$711	3.0	Ocean Township School Staff	X
71	Lighting Occupancy Controls - Administration Building	$1,351	$80	16.8	Public Bidding for Subcontractors	X
72	Lighting Occupancy Controls - Ocean Township High School	$64,158	$6,032	10.6	Public Bidding for Subcontractors	X
73	Lighting Occupancy Controls - Ocean Township Elementary School	$16,012	$3,165	5.1	Public Bidding for Subcontractors	X
74	Lighting Occupancy Controls - Ocean Township Intermediate School	$49,972	$3,948	12.7	Public Bidding for Subcontractors	X
75	Lighting Occupancy Controls - Wanamassa Elementary School	$7,647	$132	57.9	Public Bidding for Subcontractors	X
76	Lighting Occupancy Controls - Wayside Elementary School	$25,931	$2,593	10.0	Public Bidding for Subcontractors	X
78	Controls for Plug-in Equipment - Ocean Township High School	$10,050	$1,464	6.9	Ocean Township School Staff	X
79	Controls for Plug-in Equipment - Ocean Township Elementary School	$5,550	$950	5.8	Ocean Township School Staff	X
80	Controls for Plug-in Equipment - Ocean Township Intermediate School	$12,300	$2,084	5.9	Ocean Township School Staff	X
81	Controls for Plug-in Equipment - Wayside Elementary School	$5,700	$1,062	5.4	Ocean Township School Staff	X
87	Kitchen Hood Controls - Ocean Township High School	$27,739	$3,524	7.9	JCI Implement	X
89	Kitchen Hood Controls - Ocean Township Intermediate School	$32,059	$5,862	5.5	JCI Implement	X
95	Vending Miser - Ocean Township High School	$700	$232	3.0	Ocean Township School Staff	X
96	Vending Miser - Ocean Township Intermediate School	$2,100	$270	7.8	Ocean Township	X

ECM #	ECM Description	Total Estimated Price	Annual Utility Savings without Escalation	Simple Payback	Installation Plan	Recommended For Installation
					School Staff	
97	Vending Miser - Wayside Elementary School	$350	$259	1.4	Ocean Township School Staff	X
98	High Efficiency Electric Hand Dryer Installation - Administration Building	$600	$531	1.1	Ocean Township School Staff	X
99	High Efficiency Electric Hand Dryer Installation - Ocean Township High School	$1,200	$407	3.0	Ocean Township School Staff	X
100	High Efficiency Electric Hand Dryer Installation - Ocean Township Intermediate School	$1,200	$387	3.1	Ocean Township School Staff	X
101	High Efficiency Electric Hand Dryer Installation - Wayside Elementary School	$600	$462	1.3	Ocean Township School Staff	X
102	Replace Teacher Room Refrigerators with Energy Star Models - Administration Building	$1,200	$369	3.2	Ocean Township School Staff	X
103	Replace Teacher Room Refrigerators with Energy Star Models - Ocean Township High School	$3,600	$866	4.2	Ocean Township School Staff	X
104	Replace Teacher Room Refrigerators with Energy Star Models - Ocean Township Elementary School	$3,600	$1,017	3.5	Ocean Township School Staff	X
105	Replace Teacher Room Refrigerators with Energy Star Models - Ocean Township Intermediate School	$8,400	$2,686	3.1	Ocean Township School Staff	X
106	Replace Teacher Room Refrigerators with Energy Star Models - Wanamassa Elementary School	$3,600	$1,037	3.5	Ocean Township School Staff	X
107	Replace Teacher Room Refrigerators with Energy Star Models - Wayside Elementary School	$3,600	$1,108	3.2	Ocean Township School Staff	X
135	PC Computer Management System - Administration Building	$553	$388	1.4	JCI Implement	X
136	PC Computer Management System - Ocean Township High School	$1,047	$1,323	0.8	JCI Implement	X

ECM #	ECM Description	Total Estimated Price	Annual Utility Savings without Escalation	Simple Payback	Installation Plan	Recommended For Installation
137	PC Computer Management System - Ocean Township Elementary School	$497	$484	1.0	JCI Implement	X
138	PC Computer Management System - Ocean Township Intermediate School	$1,592	$1,855	0.9	JCI Implement	X
139	PC Computer Management System - Wanamassa Elementary School	$483	$410	1.2	JCI Implement	X
140	PC Computer Management System - Wayside Elementary School	$868	$687	1.3	JCI Implement	X
141	Replace CRT Monitors - Ocean Township High School	$1,900	$1,185	1.6	Ocean Township School Staff	X
142	Replace CRT Monitors - Ocean Township Intermediate School	$4,370	$317	13.8	Ocean Township School Staff	X

TOTAL PROJECT
$3,363,795 $330,066 10.2

Demand Response and Energy Rebates/ Incentives

Demand Response - Ocean Township High School	$0	$6,806	0.0	JCI Implement	X
Demand Response - Ocean Township Intermediate School	$0	$2,269	0.0	JCI Implement	X
Grants - Local, State & Federal - Administration Building	$1,283	$3,365	0.4	JCI Implement	X
Grants - Local, State & Federal - Ocean Township Elementary School	$1,283	$6,010	0.2	JCI Implement	X

Grants - Local, State & Federal - Ocean Township Intermediate School	$1,283	$7,105	0.2	JCI Implement	X
Grants - Local, State & Federal - Wayside Elementary School	$1,283	$385	3.3	JCI Implement	X
Pay for Performance Program - NJ - Ocean Township High School	$6,417	$78,769	0.1	JCI Implement	X
Pay for Performance Program - NJ - Wanamassa Elementary School	$6,417	$19,730	0.3	JCI Implement	X

Business Case for Recommended Project

FORM VI

ESCO's PRELIMINARY ENERGY SAVINGS PLAN (ESP):

ESCO's PRELIMINARY ANNUAL CASH FLOW ANALYSIS FORM

Township of Ocean Board of Education - ENERGY SAVINGS IMPROVEMENT PROGRAM

ESCO Name: Johnson Controls Inc

Note: Respondents must use the following assumptions in all financial calculations:
(a) The cost of all types of energy should be assumed to inflate at 2.4% gas, 2.2% electric per year; and

1. Term of Agreement (years): 15
2. Construction Period (months): 12
3. Cash Flow Analysis Format:

Project Cost $3,433,934

Interest Rate to be used for proposal purposes: 2.65%

Year	Annual Energy Savings	Annual Operational Savings	Energy Rebates/ Incentives	Total Annual Savings	Annual Project Costs	Board Costs	Annual Service Costs	Net Cash Flow to Client	Cumulative Cash Flow
Installation	$17,198	$0	$39,256	$56,454	$0	$0	$0	$56,454	**$56,454**
1	$208,563	$3,459	$249,701	$461,723	$438,177	$460,889	$22,712	$834	**$57,288**
2	$213,366	$3,563	$235,612	$452,541	$439,612	$451,687	$12,075	$853	**$58,141**

Appendix 6.
CDM Smith INDEPENDENT TECHNICAL REVIEW COMMENTS

Client: Township of Ocean School
Project Name: Johnson Controls Inc. – Energy Savings Implemenation Plan - Review
Independent Technical Reviewer: Matt Goss, Nick Mittereder
Date 5-17-13

Question 1 :
ES-1 Pg 14 The utility bill data is only for a 12 month period from Nov 2011 to Oct 2012 which is a shorter time period than typically needed to have a reasonable indication of average annual utility spend. Additionally this time period during the 2012 winter season was unusually warmer than typical winters. This may result in higher electrical consumption and lower natural gas consumption compared to a typical winter season. Has this been taken into account for future savings?

Answer:
Savings have been calculated utilizing actual operating schedules obtained from interviews on site as well as building automation data extracted from the Andover Building Automation System. TMY-2 weather data has been used for the purposes of calculating energy savings related to weather conditions (typically building automation upgrades, cooling addition, etc.). The TYM2 data will be the same for baseline saving calculations as well as all future savings calculations.

Verification by CDM:
Savings are projected based on TMY-2 Historical Data Accepted - CDM Smith

Question 2: ES-1 Pg 42, 43
Be advised that current "NJ ESIP" law (as indicated in the How to Implement ESIP guide document dated Feb 2013 page 10) requires that all energy related capital improvements that do not reduce energy proposed in projects be financed by other means not included in the energy lease-purchase arrangement. In addition, energy related capital improvements projects should not be more than 15% of the total project cost. It appears that ECM# 7, 8, 9, 10, 11, 12, 13, 19 fall in to this category.
Answer:
JCI has been working with the NJ BPU in parallel review of the Energy Savings Plan and it was indicated that if the overall project had a positive balance at the end of each year and for the entire project term, the project met the requirements of the ESIP law. On past ESIP projects, capital improvements were typically seen as not relating to energy at all, such as parking lot paving, ceiling replacement, carpet/ tile replacement, etc. This item will require guidance from the District's legal and financial advisors for final resolution. As of May 30, and June 4th 2013 both bond counsel, financial advisors and BPU officials are in agreement that the Air Conditioning can be financed as part of this project.
Verification by CDM:
As noted based on continuing progress w/ NJBPU & School District. Accepted - CDM Smith

Question 3: ES-2 Pg 43and 44
There are several ECM line items that have TBD for Cost and Savings. Is this for information or possible inclusion into the final contract?
Answer:
Cost and savings have been updated for all measures and are included in Appendix 5 Page 220 of the Final Energy Savings Plan Revision.
Verification by CDM:
Accepted – CDM Smith

Question 4: ES-3 Pg 53
It appears that ECM53, Solar PV is already being installed and credit is being taken for the energy savings for this project.
Answer:
ECM 53 – Solar PV at Ocean Township Intermediate School is nearing completion and has not been installed yet. Johnson Controls will assist in system start-up and commissioning. The Energy Savings Plan Revision 3 includes these details reflecting this scope of work and can be found on page 98.
Verification by CDM:
Accepted – CDM Smith

Question 5: ES-4 Pg 57

The construction sell price does not match the recommended ECM value indicated on page 53.

Answer:

The construction sell price on page 53 includes budgeted costs for District Installed ECMs as well as Johnson Controls construction costs. The costs for District Implemented ECMs have been included in order to evaluate payback of each measure.

Verification by CDM:

Accepted – CDM Smith

Question 6: ES-5 Page53:

The term FIM (Facility Improvement Measure) is utilized in lieu of ECM (Energy Conservation Measure). Be consistent in the report with the use of ECM or FIM. Recommend ECM

Answer:

All references to FIM have been replaced with ECM in the final revision of the ESIP.

Verification by CDM:

Accepted – CDM Smith

Question 7: ES-6 Pg 57

The cash flow savings associated for demand response does not match the values indicated in Appendix 2 page 10

Answer: Appendix 2 has been updated in the final revision of the ESIP to agree with cash flow savings.

Verification by CDM:

Accepted – CDM Smith

Question 8:ES-7 Pg 57

Customer purchased and installed ECM. How does Johnson Controls plan to guarantee these ECMs. Do these items such as energy star refrigerators and hand dryers have energy savings projected out for a 15 year term? Will these items last the complete term of the contract?

Answer:

JCI will coordinate with the District to ensure proper materials are purchased and all equipment is installed in a timely manner (Prior to construction substantial completion in September 2014). JCI will verify that all equipment was properly replaced/ installed and assist in startup and any necessary training. Savings are claimed for 15 years, it is the responsibility of the customer to ensure the equipment is properly maintained in order to achieve these savings for the term of the project

Responsibility on district to maintain in proper working order.

Verification by CDM:

Accepted CDM Smith

Question 9: ES-8 Pg 61

The hot water boiler replacement utilizes condensing boilers with a fully condensing rated efficiency of 96%.To obtain the high efficiency with condensing boilers a return water temperature must be lower than typical return temperatures (<130degF) of conventional systems. Does the installed system have the ability to operate at lower return water temperatures (still meeting design heating loads) that allows the boiler to obtain the higher efficiency?

Answer:

The system currently utilizes a hot water reset temperature strategy based on outside air temperature. Although, the hot water boilers have a rated efficiency of 96% at full condensing, the savings are modeled utilizing a typical condensing boiler efficiency curve, which takes into account the varying efficiencies for each return water temperature.

Verification by CDM:

Accepted – CDM Smith

Question10 :ES-9 Pg 69

It is not clear which options are included in the additional cooling for the Elementary School, VRF, water source heat pumps??

Answer:

All options have been evaluated for the school; at this time neither option is recommended for inclusion in the Energy Savings Improvement Plan project. Please refer to the ESP ECM List in the ESP Appendix 5 Page 220..

Verification by CDM:

Accepted – CDM Smith

Question11:ES-10 Pg 72

Is the infiltration issue a makeup air situation associated with Kitchen hood exhaust? Seems like it would make sense to address/correct the infiltration issue in lieu of just accepting it and adding additional equipment and energy use. Will the kitchen hood controls (ECM 87-89) reduce or eliminate this issue?

Answer:

The infiltration issue is associated with gaps and cracks in weather-stripping, window seals, and penetrations throughout the buildings. The kitchen hood controls will address already conditioned air from the spaces rather than infiltration air.

Verification by CDM:

Accepted – CDMSmith

Quesion12: ES-11 Pg 103

Is 285 watts a typo? Maybe 28 watt?

Answer:

285 watts is a typo – it should be 25 watts and has been incorporated into the final revision of the Energy Savings Plan and can be found on page 103 and below.

Scope of Work

Existing fluorescent lamps will be upgraded to T8 25-watt lamps with electronic ballast consistent with the existing lighting system through much of the district.

Verification by CDM:
Accepted – CDM Smith

Question 13: ES-12 Pg 122
The list of bathrooms that hand driers are to be installed in is not provided.
Answer:
A table has been included in the Final Revision of the Energy Savings Plan (Page 122 and below) which details how many hand driers will be installed in each building.

Building	Qty.
Ocean Township High School	4
Ocean Township Intermediate School	4
Wayside Elementary School	2
Administration Building	2
Total	**12**

Verification by CDM:
Accepted – CDMSmith

Question 14 ES-13 Pg 158
There may be significant cost associated with upgrades/renovation work associated with the maintenance facilities to perform work on CNG buses. Or would this be outsourced?
Answer:
Upgrades to maintenance facilities would be included in construction costs for installation of the natural gas fueling station. Although this measure has been evaluated it is not recommended for implementation as part of the Energy Savings Improvement Plan Project.
Verification by CDM:
Accepted – CDM Smith

Question 15 ES-14 Pg. 162
M&V – Recommend that even "Non-Measured" ECMs be verified through corresponding IPMVP protocol.
Answer:
Several of the measures which are recommended as Non-Measured ECMs utilize accepted engineering calculations to determine energy savings. Oftentimes, the cost of measuring some of these savings cannot be justified by the Energy Savings achieved. All savings will be verified, either by direct measurement or by engineering calculations.
Verification by CDM:
Accepted-CDM Smith