



Schoolhouse Energy Report Card

June 2017



Energy Partners

National Grid
Northeast Energy Efficiency Partnership
Commerce Rhode Island
Rhode Island Office of Energy Resources
Rhode Island Infrastructure Bank

Acknowledgments

This report was prepared for the School Building Authority of the Rhode Island Department of Education. The Project Team performed analysis and prepared recommendations for the public schools in the State of Rhode Island. As a planning team, we hope this document will aid the public schools of Rhode Island in implementing energy saving opportunities that will have a positive impact on student learning.

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School Building Authority at the Rhode Island Department of Education

SCHOOLHOUSE ENERGY REPORT CARD

Executive Summary | June 2017

The School Building Authority at Rhode Island Department of Education (RIDE), as part of the state-wide K-12 public schools facilities assessment and educational space adequacy project, recently completed an energy assessment of **307 schools**.

The purpose of the School House Energy Report Card is to:

- Benchmark energy use for schools using the Energy Use Index
- Assess the condition of energy consuming systems
- Identify measures to improve energy efficiency
- Identify strategies to reduce demand for energy
- Assess the feasibility of utilizing renewable energy technologies
- Define action plans to achieve Net Zero Energy for all schools

The Jacobs energy assessment has identified six primary opportunities to save money by reducing energy consumption and replacing fossil-based energy with clean renewable energy, including converting to LED lighting, installing building automation systems, solar photovoltaics, utilizing ground source heat pumps and solar hot water, and pressurizing buildings.

The energy assessment has revealed the opportunity to save **\$33.6 million dollars annually**, achieve Net Zero Energy, improve indoor air quality and associated occupant cognitive performance, integrate renewable energy concepts into student learning and create enduring improvements that are good for budgets, healthy for students, promote learning, beneficial for the environment, and demonstrate institutional values



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Introduction

The School Building Authority at Rhode Island Department of Education (RIDE), as part of the State-wide K-12 public schools facilities assessment and educational space adequacy project, recently completed an energy assessment of 307 schools. The energy assessment has revealed the opportunity to save \$33.6 million dollars annually, achieve Net Zero Energy, improve indoor air quality and associated occupant cognitive performance, integrate renewable energy concepts into student learning and create enduring improvements which are good for budgets, healthy for students, promote learning, beneficial for the environment, and demonstrate institutional values.

K-12 public schools facilities assessment and educational space adequacy is required to be conducted once every 5 years. Research and associated technological advances are being made at a rapid pace, therefore it is beneficial to constantly fine tune the learning environment to keep pace with emerging technology and methodology. The process is very beneficial with respect to energy conservation. T8 LED lighting technology has advanced very quickly and prices have dropped, making this technology cost effective.

This School House Energy Report Card will introduce the assessment methodology, approach, findings, acknowledgement of participants/supporting entities and funding sources available to help pay for projects. The desired outcome of this effort is to reduce energy consumption to the point where renewable solar photovoltaic energy can satisfy the Rhode Island Public School's demand for energy.

This Report Card explains how indoor air quality (IAQ) can be improved by pressurizing the building with Energy Recovery Ventilation (ERV)/Dedicated Outside Air Handling (DOAS), filtering/dehumidifying/tempering outside air and delivering fresh outside air to classrooms. Controlled delivery of fresh outside air ensures that carbon dioxide levels remain healthy at all times. Healthy carbon dioxide levels facilitates cognitive performance, focus and initiative. Dehumidifying and filtering, removes humidity and particulate from the air which has a favorable effect on students and teachers who are sensitive to high humidity levels, dust, pollen, mold and dander.

Through the implementation of cost effective energy conservation measures and making all public schools Net Zero Energy, schools can eliminate heating and cooling related energy costs. In doing so, school facilities can reduce energy consumption by up to 30%, carbon foot print by 100%, emissions by 100%, improve indoor air quality, demonstrate institutional values, and utilize solar PV, geothermal energy and energy conservation technologies as instruments of learning. Reducing energy consumption, achieving Net Zero Energy Schools and involving students in the process is inspirational, helps build and prepares them for life's challenges and further success in college, careers and life.

METHODOLOGY

The School House Energy Report Card one piece of the larger Facility Condition Assessment effort. The strategy followed includes utilizing data collected (i.e. equipment age, type, size, quantity, condition, photographic images, cost estimates, and remaining useful life) as part of the Facility Condition Assessment to contribute to The School House Energy Report Card. Assessment information related to architectural, structural, mechanical, electrical, plumbing, lighting, and fire/life safety systems was collected in real time using handheld computers and uploaded to the Jacobs's MAPPs™ assessment planning software. Using this information, 6-14 typical energy conservation measures (ECMs) and Net Zero Energy Measures (ZNEMs), per school, were developed along with a reasonable order of magnitude estimation of installation costs. The annual savings for each of the energy conservation measures was calculated using industry standards, engineering rules of thumb, and best practices. The payback period was calculated by dividing installation costs by the budget level estimate of annual savings. Project management and funding sources to help manage these projects and defray the costs of energy conservation measures were researched and identified. The sources included but were not limited to:

- National Grid Energy Efficiency Programs
- RI- Rhode Island Infrastructure Bank (<http://www.riinfrastructurebank.com/>)
- RI - Efficient Buildings Fund (<http://www.energy.ri.gov/RIEBF/>)
- RI - Renewable Energy Fund/Grant Small Scale (up to 25 KW)
- RI - Renewable Energy Fund/Grant Commercial Scale (250 KW - 1MW)
- RI - Renewable Energy Growth (26-250 KW) Rhode Island Renewable Energy Fund (RIREF)

Utility cost data from the Rhode Island Uniform Chart of Accounts (UCOA)* was analyzed using energy unit cost for natural gas, electricity and No. 2 Fuel Oil for the period 2011-2014. The gross square foot area for each public school was imported into Excel for use in energy and cost benchmarking. Each school was bench marked for energy consumption using two common metrics:

- Energy Use Index (EUI) kBtu/SF
- Energy Cost/SF

EUI was not normalized for weather (heating and cooling degree days.) The Energy Star Portfolio Manager website utilizes weather data algorithms to normalize energy data for weather and to calculate source EUI. Since the EUI was not normalized for weather, caution should be used when comparing this benchmark to other schools outside of the State of Rhode Island.

*(<http://www.ride.ri.gov/InformationAccountability/RIEducationData/UniformChartofAccounts.aspx>)

Approach to Scope

The purpose of the School House Energy Report Card was to:

1. Benchmark energy use for schools using the Energy Use Index
2. Assess the condition of energy consuming systems
3. Identify measures to improve energy efficiency
4. Identify strategies to reduce demand for energy
5. Assess the feasibility of utilizing renewable energy technologies
6. Define action plans to achieve Net Zero Energy for all schools

As part of the state-wide K-12 public schools facilities assessment and educational space adequacy project, energy engineers empirically derived and analyzed energy consumption values from building information and utility cost data provided from the publicly available Uniform Chart of Accounts (UCOA)* for the period 2011 – 2014. Concurrently, Jacobs' building professionals and sub-consultants surveyed each school's energy consuming systems such as mechanical, electrical, plumbing, lighting, and fire/life safety systems. A list of energy conservation and Net Zero Energy measures were developed and provided for each school. A School House Energy Report Card was developed for each school. Summary tables showing Energy Conservation Measures (ECMs) and Net Zero Energy Measures (NZEMs), budget level cost to implement these measures, reasonable order of magnitude of savings and simple payback period based on these values are included as Appendices. The Energy Report Card identifies potential sources of rebates, incentives, grants and financial instruments but does not quantify their magnitude. The approach used was similar in nature to an ASHRAE Level 1 Energy Audit. Since the audit was part of a Facility Condition Assessment, the assessors provided information on the condition, age, size and years of remaining service for equipment and systems. This activity started in March and commenced in September of 2016.

*Jacobs was not allowed to access the Rhode Island Public School Energy Star Portfolio Manager website because the associated utility data was considered sensitive and releases could not be provided in time to achieve project deadlines.



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Findings

The approximate average age of a school building in the State of Rhode Island is 60 years, with 66.7% of the school buildings being between 35 and 85 years old. The State of Rhode Island has the 4th highest average residential electric rate in the United States at 18.69 cents/kWh. Figure 1 demonstrates the mix of fuels composing RIDE's energy consumption. Public schools in Rhode Island spent between \$28.4(2012) - \$33.6 (2011) million per year in utilities in the period 2011-2014.

- \$15.5-17.4 Million spent annually on electricity
- \$8.2 -10.7 Million spent annually on natural gas
- \$4.3-7.1 Million spend annually on No. 2 Fuel Oil

Table 1: Yearly Energy Costs by Type

	ELECTRICITY (\$)	NATURAL GAS (\$)	FUEL OIL (\$)	TOTAL ENERGY COST (\$)
2011	\$17,434,845.96	\$9,104,285.94	\$7,118,687.76	\$33,657,819.66
2012	\$15,833,735.46	\$8,282,212.55	\$4,347,688.61	\$28,463,636.62
2013	\$15,575,733.04	\$9,283,844.69	\$4,475,885.61	\$29,335,463.34
2014	\$16,118,947.03	\$10,668,684.41	\$4,900,188.61	\$31,687,820.05

Table 2: Yearly Energy Consumption by Type

	ELECTRICITY (KWH)	NATURAL GAS (CCF)	FUEL OIL(GALS)
2011	107,622,505.93	6,296,186.68	2,372,895.92
2012	97,739,107.78	5,562,264.98	1,175,050.98
2013	101,802,176.73	6,075,814.59	1,147,662.98
2014	104,941,061.39	8,276,714.05	1,400,053.89

ELECTRICITY
NATURAL GAS
FUEL OIL

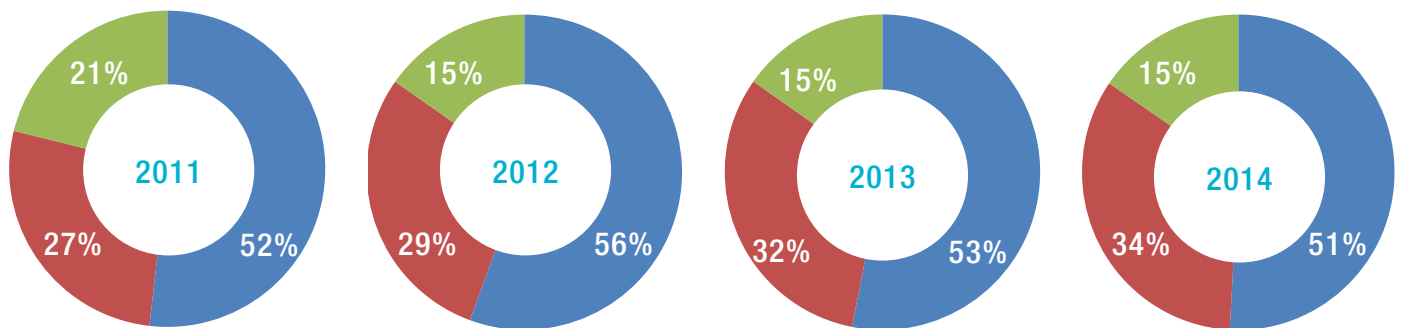


Figure 1: Percent of Yearly Fuel Cost by Fuel Type

ENERGY USE INDEX (EUI)

The Site Energy Use Index (EUI) for the public schools during the period 2011-2014 was 45.28 (2012) – 60.97 (2014) kBtu/SF . versus the national average¹ of 58.2 kBtu/SF. The average public school utilities cost expenditure was 1.21 (2012) – 1.48 (2014) \$/SF. Figure 2² demonstrates statistical analysis regarding cost expenditures. Appendix B contains ECM payback periods at each campus and Appendix C details ECM costs and EUI per SF by campus.

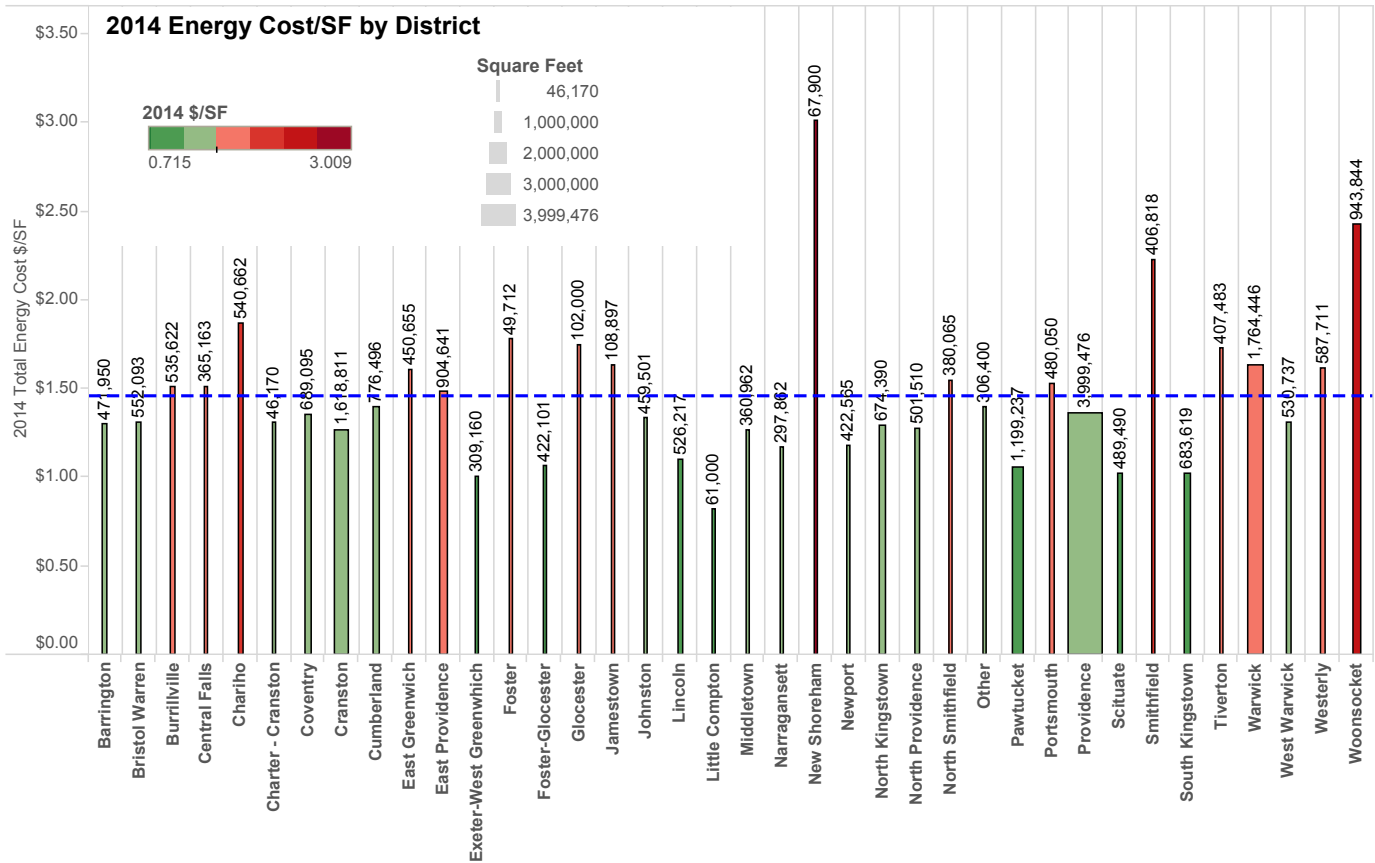


Figure 2: Energy Cost by District (\$/SF)

¹ <https://portfoliomanager.energystar.gov/pdf/reference/US%20National%20Median%20Table.pdf>

² <https://public.tableau.com/profile/paul.mills#!/vizhome/rideenergy/RIDEEnergyFindings>

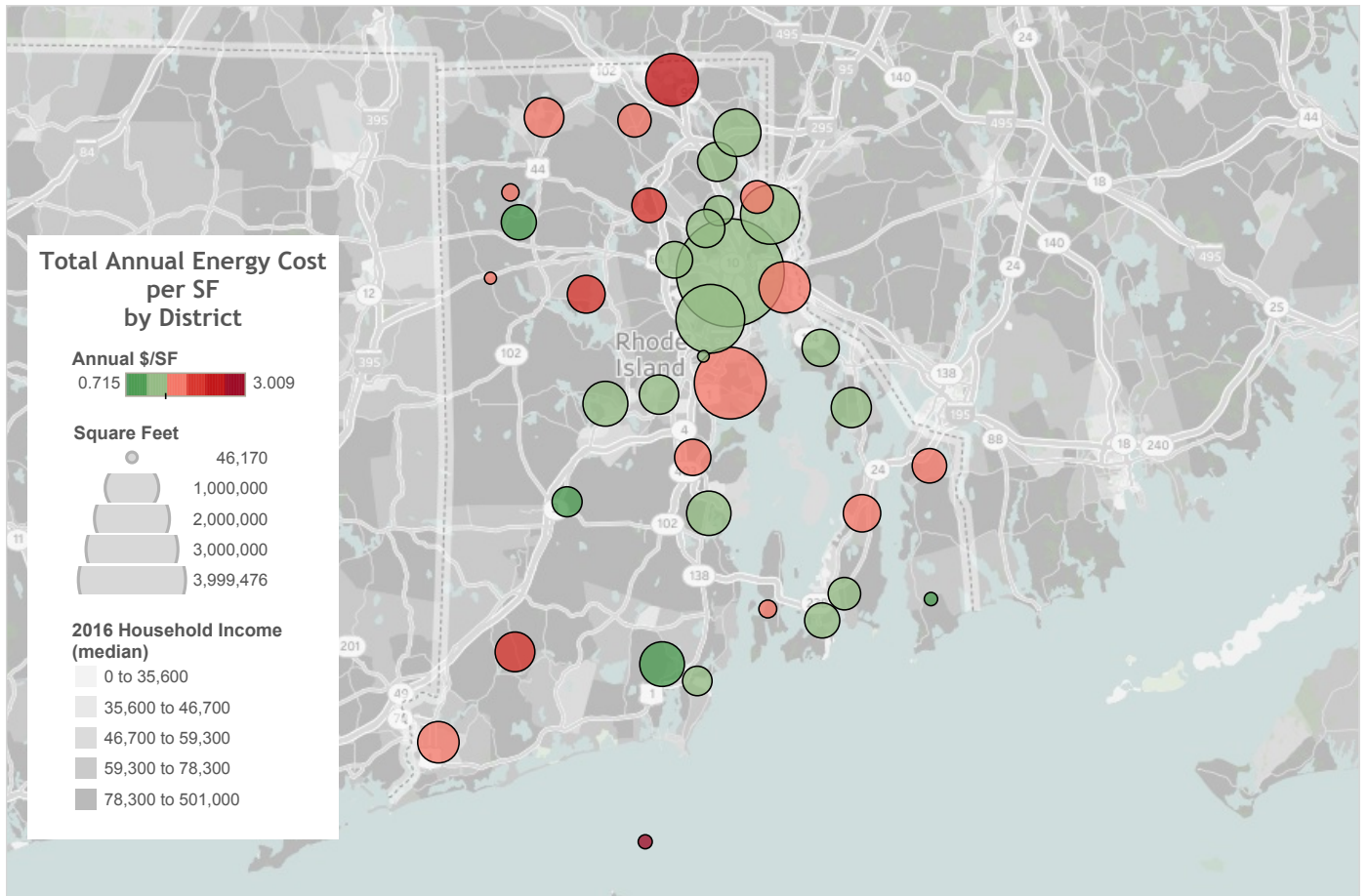


Figure 3: Map of Energy Cost by District (\$/SF)

Approximately 95% of the electricity generated for The State of Rhode Island is produced from natural gas. public schools utilize natural gas and No. 2 Fuel Oil for space heating. Fossil fuels are non-renewable, that is, they draw on finite resources that will eventually dwindle, becoming too expensive or too environmentally damaging to retrieve. In contrast, the many types of renewable energy, including solar energy, are constantly replenished and will never run out.

Many of Rhode Island's public schools have already implemented the most simple and cost effective energy conservation measures, which include:

- Lighting Upgrade
- Boiler modification to run on natural gas (where available.)

ENERGY CONSERVATION MEASURES

The Jacobs energy assessment has identified six primary opportunities to save money by reducing energy consumption and replacing fossil-based energy with clean renewable energy.

To further reduce energy consumption LEA's should consider:

- Upgrade lighting to the most energy efficient technology currently available, LED Interior lights and Solar Powered LED exterior lights.
- Install Building Automation System (BAS), network classrooms and equipment where not currently installed and networked
- Utilize the BAS to implement energy efficient scheduling and programming (night time temperature set back, hot water temperature reset, occupancy-based schedules and temperature settings, morning warm up/cool down and building flush/refresh with outside air).
- Improve indoor air quality by pressurizing the building with Energy Recovery Ventilation (ERV)/Dedicated Outside Air Handling (DOAS), filtering/dehumidifying/tempering outside air and delivering fresh outside air to classrooms. Controlled delivery of fresh outside air ensures that carbon dioxide levels remain healthy at all times. Healthy learning environment carbon dioxide levels facilitates cognitive performance, focus, and initiative. Filtering removes particulate from the air which has a favorable effect on students and teachers who are sensitive to dust, pollen, mold, and dander.
- Install solar photovoltaics panels at each school or at a generating site allocated for the school. Meeting the energy demands for the school using solar photovoltaics reduces the site's potentially harmful air emissions and energy carbon foot print to zero.
- Transition to geothermal ground-source heat pumps as the source for heating and cooling. Switching fuel sources from natural gas to electrically powered heat pumps curtails on-site combustion and opens the door for associated electricity to be provided by the solar photovoltaics.

The associated reasonable order of magnitude implementation cost, estimated annual savings, associated simple payback period and size of systems is presented in Table 3. Appendices A details a summary of the cost of ECMs by District.

Table 3: ECM Measures

Energy Conservation Measure	Cost to Implement	Annual Savings (Estimate)	Simple Payback (Years)	System Size
Building Automation System	\$4,830,000	\$149,920	32.22	
ERVs/DOAS	\$6,855,500	\$211,411	32.43	
Solar Hot Water	\$14,340,000	\$345,239	41.54	
Solar Photovoltaics	\$246,916,430	\$13,527,620	18.25	125MW Array generating 150,000 MWH/year
LED Lighting	\$64,121,905	\$2,796,098	22.93	
Heat Pumps (Geothermal)	\$389,677,907	\$20,186,799	19.30	87,000 Tons of geothermal heat pump

Estimated simple payback periods provided in the School House Energy Report Card are prior to any rebates, incentives, grants or tax incentives. Rebates, incentives, grants and tax credit programs are fluid and transient. A program which exists today, could be modified or discontinued and not be available one year from today. Project development and execution will require months to years to execute. It is possible that the rebate or incentive used to justify a project in 2016 may not be available in 2017. In contrast an incentive program available in 2016 may not be as lucrative or facilitative as the same incentive in 2017. A perfect example of this is recent legislation, passed in 2016, expanding the size of community net metering sites from 5 MW to 10 MW.

The study takes a conservative approach by presenting the worst possible engineering economics scenario. Our cost savings estimates are conservative and include energy savings costs only. The cost savings estimates do not include reduction in maintenance costs. For example, a T8 LED bulb has an expected life of 50,000 run hours vs. a T8 Fluorescent which has an expected life of 20,000 run hours. Therefore the LED bulb will run more than twice as long before it requires replacement. That represents significant maintenance cost savings that we do not claim in our calculations. It is highly likely that project cost will be reduced by 20-50% once rebates, incentives, grants or tax incentives are taken.

Public schools in Rhode Island currently consume 98,000– 106,000 megawatt hours of electricity per year at an associated cost of \$15-17 Million annually, which equates to approximately 15.5-16 cents per kilowatt hour. When natural gas-fired boilers and domestic hot water heaters are replaced with ground-source heat pumps and electric hot water heaters, natural gas consumption will decrease to zero and be displaced by approximately 44-50,000 megawatt hours of green renewable energy produced from solar photovoltaic arrays.

To serve all public schools, after ECM's are installed, it is estimated that 150,000 Megawatt hours (MWH) of solar generated power is required. The total capacity for this level of power generation in Rhode Island is about 125 Megawatts. For ground-mounted solar (PV) it takes about 7 acres of land for each 1 Megawatt (MW) of capacity, so a total of 875 acres of space is needed. For an average school there would be a need for 2 to 4 acres of land, without shade, to site a solar PV system to achieve Net Zero Energy with actual on-site solar generation.

There is significant economy of scale for solar projects. The current cost for ground mounted solar / PV for projects larger than 5 MW is about \$1,800,000 per MW (\$1.80/Watt). For projects as large as 125 MW this totals about \$225 Million. Smaller projects that are roof mounted can cost from \$2.75 to \$3.25/Watt.

Private for-profit entities (like a Power Purchase Agreement Provider) can utilize Federal Tax Credit and Deduction Incentives that reduce the cost by about 40% (ITC & MACRS), but they must retain ownership for at least 5 years. They can lease the facility, or can sell the power to an off-taker using a Power Purchase Agreement (PPA).

Public non-profit entities cannot utilize the Federal Tax Credit and Deduction Incentives. They can, however, lease the equipment or purchase the power.

Rhode Island allows for Net-metering. This means that renewable power facilities can use the Utility as a virtual battery. These facilities send (and are credited for) excess solar power onto the grid during bright and sunny times, and then use grid power during night-time and cloudy periods.



Recommendations

SOLAR PHOTOVOLTAICS

There are two primary options to consider for siting of solar PV arrays:

- Roof mount and ground mount at each school
- Up to 10 Megawatt community virtual net-metering at remote generating sites

Given that the current cost for ground-mounted solar (PV) for projects larger than 5 MW is about \$1.8 million per MW, there is significant economy of scale for these efforts. The total cost for a 125 MW project totals about \$225 million. Smaller projects that are roof mounted can cost from \$2.75 to \$3.25/Watt. Maintenance and operations of aggregated arrays in a community net-metering site is more economical.

The Omnibus Renewable Energy Bill enacted in June 2016 amended the net-metering statute in Rhode Island to establish community virtual net-metering, increase system size capacity from 5 MW to 10 MW, and allow third party owned systems to be eligible for net-metering.

Facilities owned by a public entity or multi-municipal collaborative or owned and operated by a developer on behalf of the public entity or multi-municipal collaborative through a “public entity net-metering financing arrangement” are eligible for meter aggregation.

From these parameters it is apparent that the most pragmatic approach is to establish a state-wide program that develops and helps implement a template agreement that:

- Allows for multiple schools to aggregate meters with a 3rd Party Financier/Developer for solar projects in the 5 MW to 10 MW range to be built in their local region.
- Enables the schools to agree to a Power Purchase Agreement (PPA) for the solar power at a set rate, for a set period of time (up to 25 years).
- Affords aggregate schools an option to purchase the solar project at the 6 year anniversary for a pre-determined discounted price.
- Ensures the schools that participate are given a media and interactive (via Internet) means to track the production of power and other parameters for their associated solar projects, as well as the right to visit the solar sites for science education and workshops.

An option to this program is the setting up for State Bonding (or another financial vehicle) to purchase the solar facilities at the 6 year period at the pre-determined discounted rate. This Bond is repaid from the electricity savings and, after full repayment (in 5 to 6 years), a revolving fund is established for future energy programs, as well as O&M for school energy infrastructure.

GROUND-SOURCE HEAT PUMPS

To achieve Net Zero Energy it is recommended that schools adopt a strategy to migrate heating systems to electrically powered ground-sourced heat pumps and migrate to electric domestic hot water heaters or solar assisted domestic hot water heaters. Existing natural gas/No. 2 Fuel Oil boilers may remain in place to be used for redundancy and/or emergency backup. Existing hydronic heating systems will remain in place and fully utilized, the only change will be the heat source, which will be a heat exchanger between the existing hydronic system and ground-sourced heat pump instead of the boiler. Electricity to power the ground-sourced heat pump will be derived from renewable energy (most likely solar photovoltaic panels) operating using a net-metering** strategy.

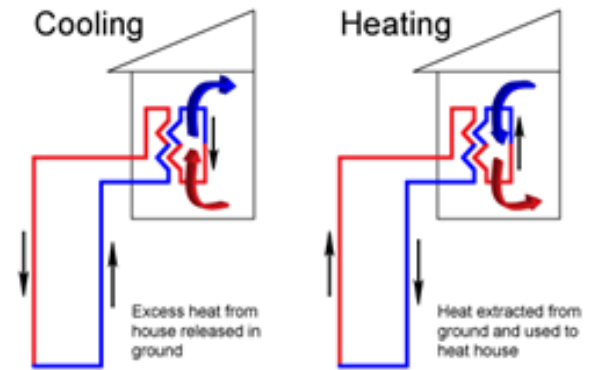


Figure 4: Cooling and Heating with Ground Source Pumps

NET ZERO ENERGY

A net-zero energy building (NZEB), is a building with zero net energy consumption, meaning the total amount of energy used by the building on an annual basis is roughly equal to the amount of renewable energy created on the site, or in other definitions by renewable energy sources elsewhere. The most logical choice for achieving Net Zero Energy Buildings is to utilize electricity produced from solar photovoltaic arrays either sited on the school campus or elsewhere operating on a “net-metering” basis and generating all the energy required for the school on an annual basis.

Next to staffing, utilities are the biggest budget line item for most schools and one of the few fixed operational costs that can be significantly reduced, or even negated. School administrators are being asked to provide a higher level of service—whether it’s special programs, testing requirements, or extending the school day—while their budgets are being reduced. Every dollar saved on operations and maintenance costs is a dollar that can be spent for other programs. Laws in The State of Rhode Island make it easier for schools to participate in Power Purchase Agreements (PPA) and take advantage of tax incentives and buy out clauses to significantly reduce their investment costs. After the capital investments have been repaid, 100% of the budget that was spent on energy can be reallocated to student learning.

Net Zero Energy Buildings allow for predictability in energy costs. Generating electricity from solar power eliminates energy price volatility for the life of the school building. Net Zero School Buildings become living laboratories. Ground-level photovoltaic installations and exposed infrastructure make it easy for students to get up close and interact with the systems. Building Automation Systems and associated energy dashboards allow students to study trends, energy consumption and the effects of shade, energy conservation strategies and curtailment efforts.

Net Zero Energy Buildings are a win-win. They enhance student learning, greatly reduce energy costs, eliminate emissions from combustion, help improve air quality and demonstrate institutional values through actions.

**A system in which solar panels or other renewable energy generators are connected to a public-utility power grid and surplus power is transferred onto the grid, allowing customers to offset the cost of power drawn from the utility.

BUILDING PRESSURIZATION

Approximately 60% of the public schools in Rhode Island are elementary schools. By and large, associated fresh air ventilation requirements are met through the use of operable windows. Teachers, students and administrators open windows to allow fresh air into the building. This fresh air could be cool or cold, humid, or contaminated with particulate matter (dust, pollen, dirt, dander, smoke or the like.) During heating season this often proves to be an ineffective ventilation strategy. As a result cold drafts have an unfavorable effect on the learning environment. It is recommended that schools which currently satisfy fresh air requirements through the use of operable windows consider migrating to the following strategy:

- Positively pressurize the school building(s) utilizing Energy Recover Ventilation (ERVs) or Dedicated Outside Air handling Units (DOAS) to deliver conditioned, filtered and tempered (app. 65° Deg. F) air to the indoor learning environments. The associated supply air fans and differential offset airflow between the exhaust air fans will act to positively pressurize the building and keep undesirable, unfiltered outside air out of the building.
- Utilize heating hot water and chilled water coils located in the ERVs and DOAS to heat, cool, and dehumidify ventilation air provided by this equipment.
- Heating hot water and chilled water shall be produced by the ground-sourced heat pumps.
- ERVs and DOAS have minimum efficiency reporting value filters which will remove particulate contamination from the fresh air being introduced to the learning environment.
- Recover heat energy from exhaust air and reuse that energy to pre-heat incoming, cool, fresh outside air.

The benefit of adopting this strategy is improved indoor air quality (IAQ) by ensuring that all fresh air for ventilation is filtered, dehumidified and tempered to eliminate undesirable drafts. Studies have proven that maintaining occupied space carbon dioxide at healthy levels (not greater than 700 ppm above ambient CO₂ level) facilitates cognitive performance, shown in Figure 5.

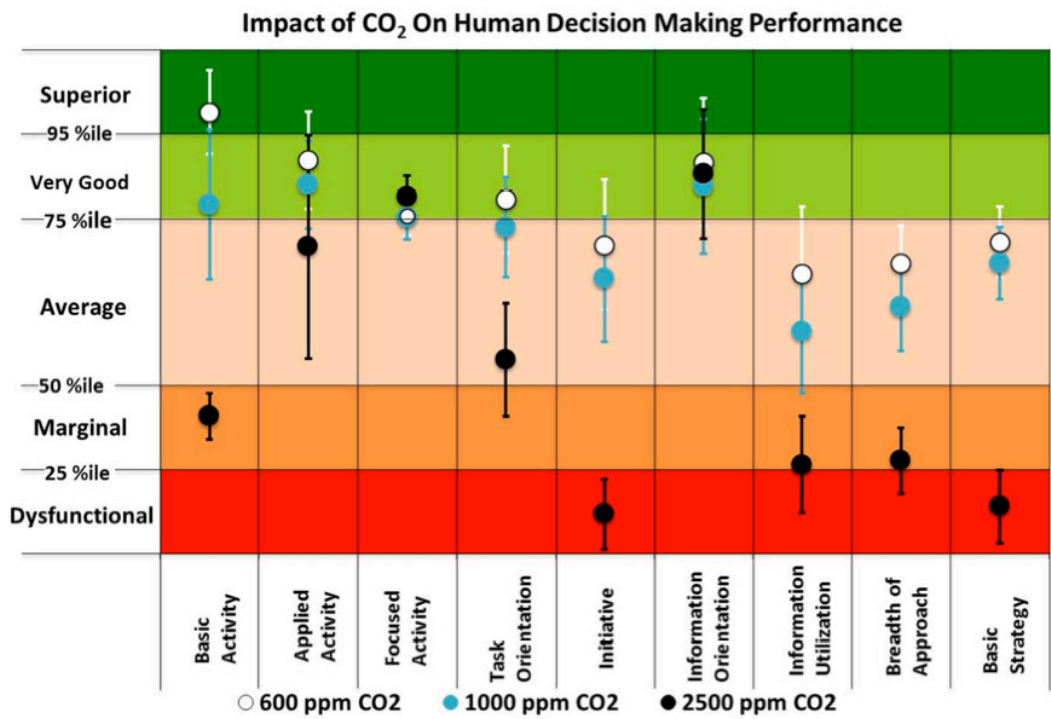


Figure 5: Impact of CO₂ on Human Decision Making Performance

LIGHTING

Public schools can cost effectively reduce existing lighting related electrical energy consumption by as much as 50% by upgrading interior lighting from T8 fluorescent to T8 LED (12-18 watt/bulb) lighting technology utilizing existing occupancy sensors. Exterior lighting systems can be upgraded to solar powered LED lights, completely eliminating demand for associated electrical energy consumption, and replacing it with electricity derived from integrated photovoltaic panels. As a result of incentives from the National Grid, most schools have reduced electrical energy consumption by upgrading interior lighting systems to T8 fluorescent lighting systems with occupancy based lighting controls.

How beneficial is LED lighting? At Cherokee Elementary School in Scottsdale, Ariz., modern LED lighting fixtures not only save energy, they also prevent special education students with autism from being bothered by fluorescent lighting. Researchers maintain that individuals with autism are more vulnerable to the sub-visible flicker of direct fluorescent lighting, which can cause headaches, eyestrain, and increased repetitive behavior².



² http://www.k-12techdecisions.com/article/led_lighting_saves_one_school_money_and_creates_a_better_learning_environment#

EXECUTION

The study recommends that LEAs prepare Requests for Qualifications (RFQ) and subsequent Requests for Proposals (RFP) from those shortlisted from the RFQ Process for:

Fixed-price Design Build Contracts:

- Implement the energy conservation measures (ERVs/DOAS, Building Automation Systems, solar assisted domestic hot water heaters) identified for each school in the LEA. The Design Build firms will be responsible for system design, permitting, build-out of the systems, project management, and securing incentives, rebates, and grants on behalf of the LEAs to help fund the energy conservation projects.
- Retrofit interior lighting to LED technology and exterior lighting to LED with integral solar PV for each school in the LEA. The Design Build firms will be responsible for system design, permitting, build out of the systems, project management, and securing incentives, rebates, and grants on behalf of the LEAs to help fund the lighting retrofit.

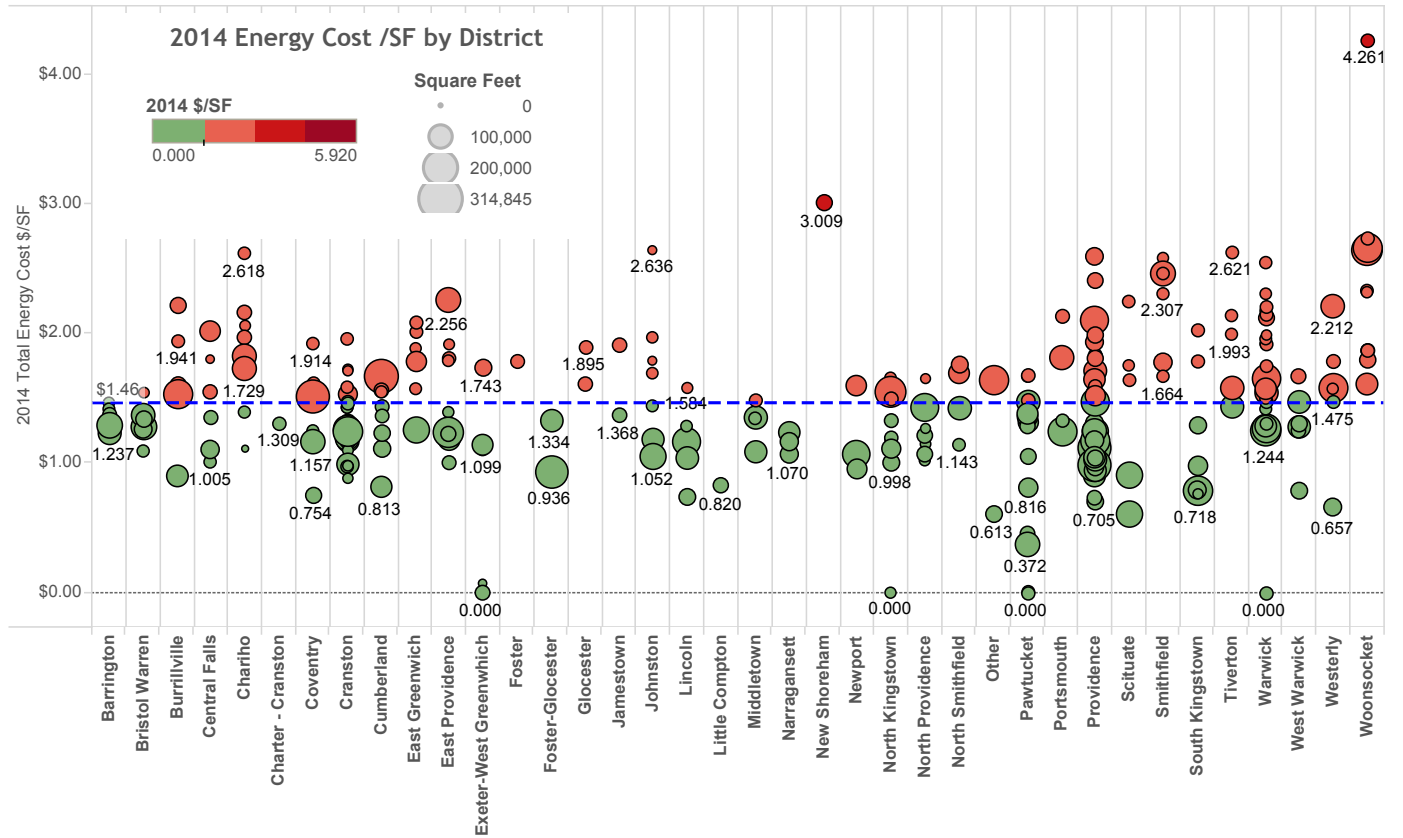
Power Purchase Agreements:

- Power purchase agreement(s) to provide 125 MW Array generating 150,000 (MWH/yr) solar PV arrays and subsequent ongoing maintenance. The Power Purchase Agreement provider(s) will be responsible for system design, permitting, build out of the systems, project management, operations & maintenance, and securing incentives, rebates, and grants on behalf of the LEAs to help fund the energy conservation projects.
- Power purchase agreement(s) to provide 87,000 tons of geothermal heat pumps at each school, associated geothermal wells and design build of mechanical, electrical and control systems to integrate heating and cooling capacity into existing systems or system to be built. The Power Purchase Agreement provider(s) will be responsible for system design, permitting, build out of the systems, project management, operations & maintenance, and securing incentives, rebates, and grants on behalf of the LEAs to help fund the energy conservation projects.

Phased Approach

Should LEAs be interested in taking a phased approach to project execution, consider selection of some trial schools. Select at least one school of each type (Elementary, Middle, and High School.) For assistance in selecting schools to work on first, please refer to Figure 6 presented below.

Figure 6: RIDE 2014 Energy Cost (\$/SF) by District



FUNDING

How do the public schools in Rhode Island pay for these infrastructure improvements and modifications? There are several financial instruments, incentives, rebates, and grants available to assist in the establishment, acquisition and funding of renewable energy and ground-source heat pumps. Solar PV can be established through power purchase agreements featuring a buyout clause in year six.

The study suggests that public schools in Rhode Island take advantage of the Efficient Buildings Fund administered by the Rhode Island Infrastructure Bank to facilitate the implementation of energy conservation measures and Net Zero Action Plans. Savings derived from the associated energy conservation and reduction of energy costs are used to repay the loan made from the Rhode Island Infrastructure Bank revolving loan fund.

REBATES, INCENTIVES, GRANTS, AND TAX INCENTIVES

A variety of rebates, incentives, grant and tax incentive programs exist federally in the State of Rhode Island. Table 4 identifies which programs are available to assist with funding for each technology. Funding level and applicable program varies based on size and type of installation. Some rebates are prescriptive, in that they are based on the number of fixtures, while others are custom and based on a percentage of the project cost. Rebates, incentives, grant and tax incentive programs are fluid and transient. A program which exists today could be modified or discontinued and not be available one year from today. For example, as technology and energy codes advance a T8 fluorescent bulb may no longer be the baseline, giving way to T8 LED bulbs as the baseline, therefore the incentive may no longer exist for an upgrade to T8 LED lights.

Table 4: Programs Available for Technology Funding

	RI - Renewable Energy Fund/Grant Small Scale (up to 25 KW)	RI - Renewable Energy Fund/Grant Commercial Scale (250 KW - 1MW)	RI - Renewable Energy Growth (26-250 KW)	National Grid Energy Efficiency Programs	Net Metering	Rhode Island Renewable Energy Fund (RIREF)	Rhode Island Infrastructure Bank (RIIB) Efficient Buildings Fund (EBF)
Solar Photovoltaic	✓	✓	✓		✓	✓	✓
Solar Domestic Hot Water Heater	✓					✓	✓
On Sight Wind Generator	✓	✓	✓		✓	✓	✓
Ground Source Heat Pump				✓		✓	✓
Hydro-Electric			✓		✓	✓	✓
Tidal Energy					✓	✓	✓
Wave			✓		✓	✓	✓
Ocean Thermal						✓	✓
Fuel Cells w/Renewable Fuels						✓	✓
Custom Programs				✓		✓	✓

National Grid

Solar Wise

National Grid offers a Solar Wise program in which customers first implement energy conservation measures and then they qualify for national Grid's RE Growth Program (most likely medium solar 26-250 kW DC) in the case of most Rhode Island public schools.

Financial Incentives

National Grid provides technical guidance and financial incentives that cover up to 45% of the equipment and installation costs. A variety of control technologies are available, including occupancy sensors, daylight harvesting for maximizing natural light, and addressable systems that allow occupants to adjust their own lighting levels. For existing facilities with equipment upgrade potential National Grid offers custom incentives that can cover up to 50% of the total costs of more efficient equipment. These incentives accelerate the payback period and maximize the opportunity to reduce operating costs and enhance building value. Custom incentives are based on the unique energy-savings criteria of a project. National Grid will also provide incentives for energy management systems. National Grid currently offers an incentive for Ground Water Sources heat pumps which qualify. The incentive is \$150/ton.

Pay-for-Performance

National Grid also offers Pay-for-Performance (P4P) incentives as an alternative to their standard incentive structure. The standard incentives are calculated as a percent of project cost whereas under P4P there is a specified incentive paid for each kWh or therm saved.

Renewable Energy Fund

The Renewable Energy Fund (REF) provides grants and loan opportunities for eligible renewable energy technologies for preliminary feasibility studies as well as direct residential, commercial, and municipal installations. The REF program is currently administered by the Rhode Island Commerce Corporation with the Office of Energy Resources.

Private Funding

Private for-profit entities (like a Power Purchase Agreement Provider) can utilize Federal Tax Credit and Deduction Incentives that reduce the cost by about 40% (ITC & MACRS), but they must retain ownership for at least 5 years. They can lease the facility, or can sell the power to an off-taker using a Power Purchase Agreement (PPA).

Public non-profit entities cannot utilize the Federal Tax Credit and Deduction Incentives. They can, however, lease the equipment or purchase the power. Rhode Island allows for Net-metering. Power Purchase Agreement providers may qualify for additional incentives through the Rhode Island Commerce Corporation.

CONCLUSION

Through the implementation of cost effective energy conservation measures and making all public schools Net Zero Energy, state-wide savings can be as much as \$33.6 million dollars annually. In doing so, the public schools in the State of Rhode Island can reduce energy consumption by up to 30%, carbon foot print by 100%, emissions by 100%, improve indoor air quality, demonstrate institutional values and utilize solar PV, geothermal energy and energy conservation technologies as instruments of learning. Reducing energy consumption, achieving Net Zero Energy Schools, and involving students in the process is inspirational. It helps build and prepare them for life's challenges and further successes in college, careers, and life.



Appendix A: Summary of ECM Costs By District

Energy data not available for schools without ECM values.

District Name	Install Building Automation System	Install Dedicated Outdoor Air System	Install Solar Assisted Hot Water	Install LED Lighting	Install Ground Source Heat Pumps	Install Solar Panel or Wind Power Generator
Barrington	\$ 135,000	\$ 211,500	\$ 360,000	\$ 1,680,525	\$ 10,034,030	\$ 4,414,207
Bristol Warren	\$ 135,000	\$ 188,000	\$ 420,000	\$ 1,910,990	\$ 10,529,915	\$ 6,794,572
Burrillville	\$ 105,000	\$ 211,500	\$ 300,000	\$ 2,075,850	\$ 12,085,815	\$ 6,562,872
Central Falls	\$ 105,000	\$ 141,000	\$ 360,000	\$ 1,275,971	\$ 10,310,824	\$ 3,555,552
Chariho	\$ 150,000	\$ 258,500	\$ 480,000	\$ 1,698,410	\$ 9,367,890	\$ 7,490,694
Coventry	\$ 135,000	\$ 141,000	\$ 480,000	\$ 2,398,655	\$ 13,830,495	\$ 12,037,715
Cranston	\$ 450,000	\$ 716,750	\$ 1,440,000	\$ 5,370,935	\$ 31,511,535	\$ 18,746,297
Cumberland	\$ 15,000	\$ 11,750	\$ 60,000	\$ 132,850	\$ 764,925	\$ 382,393
East Greenwich	\$ 90,000	\$ 117,500	\$ 300,000	\$ 1,180,701	\$ 6,252,855	\$ 3,046,192
East Providence	\$ 240,000	\$ 305,500	\$ 780,000	\$ 3,002,698	\$ 20,083,350	\$ 10,769,560
Exeter-West Greenwich	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Foster	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Foster-Glocester	\$ 15,000	\$ 11,750	\$ 60,000	\$ 1,003,538	\$ 4,557,000	\$ 3,317,845
Glocester	\$ 15,000	\$ 11,750	\$ 60,000	\$ 189,000	\$ 1,087,170	\$ 630,137
Jamestown	\$ 30,000	\$ 23,500	\$ 120,000	\$ 400,691	\$ 2,177,595	\$ 1,162,492
Johnston	\$ 90,000	\$ 129,250	\$ 360,000	\$ 1,124,904	\$ 6,383,055	\$ 4,731,050
Lincoln	\$ 90,000	\$ 117,500	\$ 300,000	\$ 1,346,900	\$ 5,491,185	\$ 4,027,872
Little Compton	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Middletown	\$ 120,000	\$ 176,250	\$ 240,000	\$ 1,234,699	\$ 7,099,155	\$ 4,665,078
Narragansett	\$ 45,000	\$ 117,500	\$ 180,000	\$ 1,026,932	\$ 5,904,570	\$ 4,401,753
New Shoreham	\$ 30,000	\$ 23,500	\$ 60,000	\$ 237,650	\$ 1,500,000	\$ 943,611
Newport	\$ 60,000	\$ 94,000	\$ 120,000	\$ 952,000	\$ 5,462,460	\$ 4,023,441
North Kingstown	\$ 127,500	\$ 141,000	\$ 480,000	\$ 2,217,985	\$ 12,818,190	\$ 10,427,416
North Providence	\$ 157,500	\$ 129,250	\$ 600,000	\$ 1,746,500	\$ 8,899,170	\$ 5,935,688
North Smithfield	\$ 75,000	\$ 117,500	\$ 240,000	\$ 1,275,313	\$ 7,392,105	\$ 4,613,518
Pawtucket	\$ 247,500	\$ 393,000	\$ 780,000	\$ 3,527,762	\$ 19,195,915	\$ 11,450,693
Portsmouth	\$ 82,500	\$ 129,250	\$ 240,000	\$ 1,680,175	\$ 8,977,290	\$ 6,648,895
Providence	\$ 712,500	\$ 1,151,500	\$ 1,800,000	\$ 10,437,461	\$ 59,074,377	\$ 43,351,507
Scituate	\$ 90,000	\$ 129,250	\$ 240,000	\$ 990,976	\$ 6,083,595	\$ 3,039,281
Smithfield	\$ 135,000	\$ 129,250	\$ 420,000	\$ 1,419,313	\$ 8,209,110	\$ 5,454,412
South Kingstown	\$ 165,000	\$ 164,500	\$ 420,000	\$ 2,107,116	\$ 18,512,195	\$ 6,550,560
Tiverton	\$ 60,000	\$ 117,500	\$ 120,000	\$ 533,250	\$ 5,780,880	\$ 3,395,515
Warwick	\$ 390,000	\$ 669,750	\$ 1,020,000	\$ 3,760,164	\$ 34,789,206	\$ 17,365,901
West Warwick	\$ 180,000	\$ 152,750	\$ 360,000	\$ 1,838,505	\$ 10,585,260	\$ 4,231,996
Westerly	\$ 97,500	\$ 164,500	\$ 360,000	\$ 2,042,275	\$ 10,900,995	\$ 10,734,289
Woonsocket	\$ 195,000	\$ 199,750	\$ 540,000	\$ 2,087,957	\$ 12,017,460	\$ 10,390,858
Charter	\$ 60,000	\$ 58,750	\$ 240,000	\$ 213,261	\$ 2,008,335	\$ 1,622,566
Totals:	\$ 4,830,000	\$ 6,855,500	\$ 14,340,000	\$ 64,121,905	\$ 389,677,907	\$ 246,916,430
				Total:		\$ 726,741,741

Appendix B: Summary of ECM Simple Payback Periods

Energy data not available for schools without ECM values.

District Name	Campus Name	Install Building Automation System Years	Install Dedicated Outdoor Air System	Install Solar Assisted Hot Water	Install LED Lighting	Install Ground Source Heat Pumps	Install Solar Panel or Wind Power Generator
Barrington	Barrington High School	38.94	41.05	60.00	38.87	28.76	18.26
Barrington	Nayatt School	58.93	71.60	60.00	43.33	22.55	18.26
Barrington	Primrose Hill School	49.06	61.41	60.00	41.08	38.06	-
Barrington	Hampden Meadows School	43.96	46.03	60.00	33.92	24.17	18.26
Barrington	Sowams Elementary School	49.46	98.55	60.00	39.38	16.20	18.26
Barrington	Barrington Middle School	28.71	28.66	22.99	37.00	23.47	18.26
Bristol Warren	Colt Andrews School	35.72	64.83	49.59	19.39	28.11	18.26
Bristol Warren	Guiteras School	74.26	74.23	59.41	41.00	32.70	18.26
Bristol Warren	Rockwell School	69.77	69.12	88.89	28.87	9.76	18.26
Bristol Warren	Kickemuit Middle School	48.72	-	29.41	30.27	25.75	18.26
Bristol Warren	Mt. Hope High School	34.96	50.69	34.96	41.62	32.90	18.26
Bristol Warren	Hugh Cole School	32.77	29.49	87.40	32.61	20.84	18.26
Burrillville	William L. Callahan School	21.91	42.73	58.44	38.48	18.29	18.26
Burrillville	Austin T. Levy School	27.78	37.89	48.37	34.63	13.03	18.26
Burrillville	Burrillville High School	15.35	31.11	20.46	34.16	15.76	18.26
Burrillville	Burrillville Middle School	47.93	41.61	85.20	44.55	44.51	18.26
Burrillville	Steere Farm Elementary School	47.93	41.61	85.20	44.55	44.51	18.26
Central Falls	Ella Risk School	62.66	45.08	167.10	26.24	36.74	18.26
Central Falls	Margaret I. Robertson School	87.00	79.03	173.99	41.10	39.44	18.26
Central Falls	Central Falls Senior High School	42.26	20.56	56.34	16.67	44.37	-
Central Falls	Capt. G. Harold Hunt School	125.89	95.08	121.38	20.29	33.20	18.26
Central Falls	Dr. Earl F. Calcutt Middle School	39.08	31.94	104.22	35.02	38.91	18.26
Central Falls	Veterans Memorial Elementary	40.88	18.96	109.02	27.08	17.51	18.26
Chariho	Hope Valley Elementary School	34.65	51.29	92.40	37.68	11.36	18.26
Chariho	Richmond Elementary School	17.83	39.32	47.54	36.47	10.29	18.26
Chariho	Chariho Regional High School	17.61	34.71	14.09	27.05	11.16	18.26
Chariho	Ashaway Elementary School	49.98	89.41	133.29	36.98	17.20	18.26
Chariho	Charlestown Elementary School	22.69	58.73	60.52	31.16	12.62	18.26
Chariho	Chariho Regional Middle School	20.20	5.56	16.16	24.81	14.52	18.26
Chariho	The R.Y.S.E. School	111.80	116.77	894.39	20.87	27.32	18.26
Chariho	Chariho Area Career & Technical Center	25.74	29.90	51.49	20.56	11.60	18.26
Charter	Segue Institute for Learning	47.45	49.65	94.89	3.50	21.44	18.26
Charter	Beacon Charter School	350.96	44.41	60.00	29.20	18.61	18.26
Charter	The Greene School	-	-	-	-	-	-
Charter	International Charter School	-	-	-	-	-	-
Charter	The Compass School	259.70	108.85	519.40	12.19	19.16	18.26
Charter	RISE Prep Mayoral Academy	-	-	-	-	-	-
Charter	The Learning Community	-	-	-	-	-	-
Charter	Nowell Leadership Academy - Central Campus	-	-	-	-	-	-
Charter	Kingston Hill Academy	84.66	88.42	135.45	11.81	30.10	18.26
Charter	Nowell Leadership Academy - Capital Campus	-	-	-	-	-	-
Charter	Highlander Charter School - Lower School (Providence)	-	-	-	-	-	-
Charter	Highlander Charter School - Upper School (Warren)	-	-	-	-	-	-
Charter	Village Green Virtual Charter School	-	-	-	-	-	-
Charter	Rhode Island Nurses Institute Middle College	-	-	-	-	-	-
Charter	Trinity Academy for the Performing Arts	-	-	-	-	-	-
Charter	SouthSide Elementary Charter School	-	-	-	-	-	-
Charter	Achievement First Illuminar/Providence Mayoral Acad	-	-	-	-	-	-
Charter	Paul Cuffee Charter School - Lower School	-	-	-	-	-	-
Charter	Paul Cuffee Charter School - Upper School	-	-	-	-	-	-
Charter	Paul Cuffee Charter School - Middle School	-	-	-	-	-	-
Charter	Founders Academy	-	-	-	-	-	-
Charter	Blackstone Academy Charter School	-	-	-	-	-	-
Charter	Blackstone Valley Prep Elementary School 1	-	-	-	-	-	-

District Name	Campus Name	Install Building Automation System Years	Install Dedicated Outdoor Air System	Install Solar Assisted Hot Water	Install LED Lighting	Install Ground Source Heat Pumps	Install Solar Panel or Wind Power Generator
Charter	Blackstone Valley Prep Elementary School 2	-	-	-	-	-	-
Charter	Blackstone Valley Prep Elementary School 3	-	-	-	-	-	-
Charter	Blackstone Valley Prep High School	-	-	-	-	-	-
Charter	Blackstone Valley Prep Middle School 1	-	-	-	-	-	-
Charter	The Hope Academy	-	-	-	-	-	-
Charter	Rhode Island School for the Deaf	-	-	-	-	-	-
Charter	Davies Career and Technical Center	-	-	-	-	-	-
Charter	The Met Public Street School	-	-	-	-	-	-
Charter	The Met East Bay School	-	-	-	-	-	-
Charter	The Met Peace Street School	-	-	-	-	-	-
Coventry	Western Coventry School	21.92	22.89	35.07	9.38	25.98	18.26
Coventry	Alan Shawn Feinstein Middle School Of Coventry	55.56	50.63	29.63	23.29	28.88	18.26
Coventry	Hopkins Hill School	66.08	33.66	105.72	22.96	26.63	18.26
Coventry	Washington Oak School	29.24	30.54	46.79	20.17	57.30	18.26
Coventry	Blackrock School	19.53	20.39	31.24	7.95	21.90	18.26
Coventry	Tiogue School	29.34	30.65	46.95	12.56	34.26	18.26
Coventry	Coventry High School	8.92	3.47	28.54	15.96	19.47	18.26
Cranston	Chester W. Barrows School	117.70	130.64	313.86	33.71	37.02	18.26
Cranston	Daniel D. Waterman School	96.17	114.66	153.88	15.45	23.58	18.26
Cranston	Cranston High School East	29.39	5.28	39.19	21.40	27.60	18.26
Cranston	Hugh B. Bain Middle School	54.27	47.58	48.24	63.52	25.55	18.26
Cranston	Edward S. Rhodes School	39.66	31.48	30.00	3.50	15.75	18.26
Cranston	William R. Dutemple School	70.79	91.12	141.59	45.37	27.30	18.26
Cranston	Oak Lawn School	116.45	47.52	310.53	34.97	40.42	18.26
Cranston	Eden Park School	24.86	59.26	50.43	31.61	11.30	18.26
Cranston	Gladstone Street School	40.05	31.88	35.60	63.80	13.76	18.26
Cranston	Garden City School	59.63	105.44	95.41	23.92	22.19	18.26
Cranston	Woodridge School	74.43	66.73	198.47	19.58	18.95	18.26
Cranston	Park View Middle School	13.37	34.92	35.66	58.34	23.83	18.26
Cranston	Stadium School	45.38	61.49	121.02	44.86	17.39	18.26
Cranston	Arlington School	84.17	70.09	224.45	9.63	17.69	18.26
Cranston	George J. Peters School	34.69	76.49	65.10	27.17	13.52	18.26
Cranston	Cranston High School West	13.32	30.20	30.00	24.02	18.35	18.26
Cranston	Stone Hill School	75.72	132.75	201.92	53.86	31.65	18.26
Cranston	Glen Hills School	64.27	118.83	101.13	44.04	25.30	18.26
Cranston	Edgewood Highland School	55.86	48.03	61.31	20.17	21.37	18.26
Cranston	Western Hills Middle School	18.60	49.63	49.60	39.08	25.12	18.26
Cranston	Hope Highlands Elementary School	32.55	17.30	86.79	36.06	21.23	18.26
Cranston	Orchard Farms Elementary School	91.86	78.67	122.48	33.56	32.65	18.26
Cranston	Ne/CPS Construction Career Academy	24.82	51.85	436.21	12.79	24.89	18.26
Cranston	Cranston Area Career & Technical Center	83.48	24.96	222.61	6.11	16.54	18.26
Cumberland	Community School	-	-	-	-	-	-
Cumberland	Garvin Memorial School	-	-	-	-	-	-
Cumberland	John J. McLaughlin Cumberland Hill School	-	-	-	-	-	-
Cumberland	Ashton School / Cumberland Pre-K Center	39.89	26.76	79.79	42.30	10.72	18.26
Cumberland	Cumberland High School	-	-	-	-	-	-
Cumberland	Joseph L. McCourt Middle School	-	-	-	-	-	-
Cumberland	North Cumberland Middle School	-	-	-	-	-	-
Cumberland	B.F. Norton Elementary School	-	-	-	-	-	-
East Greenwich	Frenchtown School	27.54	34.31	73.45	27.26	367.60	18.26
East Greenwich	James H. Eldredge El. School	48.80	27.71	97.61	19.53	10.54	18.26
East Greenwich	Archie R. Cole Middle School	-	-	-	-	-	-
East Greenwich	George Hanaford School	53.72	76.81	107.45	13.05	10.89	18.26
East Greenwich	East Greenwich High School	55.09	17.16	73.45	117.53	473.80	18.26

District Name	Campus Name	Install Building Automation System Years	Install Dedicated Outdoor Air System	Install Solar Assisted Hot Water	Install LED Lighting	Install Ground Source Heat Pumps	Install Solar Panel or Wind Power Generator
East Greenwich	Meadowbrook Farms School	28.91	54.75	46.26	17.13	7.95	18.26
East Providence	Kent Heights School	57.63	35.05	92.22	25.73	20.88	18.26
East Providence	James R. D. Oldham School	51.91	54.46	83.05	17.58	19.23	18.26
East Providence	East Providence High School	21.61	30.37	23.05	43.19	26.62	18.26
East Providence	Alice M. Waddington School	197.86	42.73	316.58	12.77	95.05	18.26
East Providence	Agnes B. Hennessey School	35.59	75.77	94.91	40.90	13.72	18.26
East Providence	Emma G. Whiteknact School	53.41	32.05	85.45	32.04	22.43	18.26
East Providence	Riverside Middle School	15.18	10.08	24.29	32.33	21.69	18.26
East Providence	Silver Spring School	58.33	71.41	93.33	25.97	22.10	18.26
East Providence	Orlo Avenue School	62.07	78.30	99.30	30.55	22.49	18.26
East Providence	Edward R. Martin Middle School	23.07	16.67	12.30	12.90	14.08	18.26
East Providence	Myron J. Francis Elementary School	46.12	30.84	92.25	3.50	25.98	18.26
East Providence	East Providence Career & Technical Center	39.67	18.97	63.48	13.47	19.06	18.26
Exeter-West Greenwich	Mildred E. Lineham School	-	-	-	-	-	-
Exeter-West Greenwich	Wawaloam School	-	-	-	-	-	-
Exeter-West Greenwich	Metcalf School	-	-	-	-	-	-
Exeter-West Greenwich	Exeter-West Greenwich Regional Junior High	-	-	-	-	-	-
Exeter-West Greenwich	Exeter-West Greenwich Regional High School	-	-	-	-	-	-
Foster	Captain Isaac Paine Elementary School	-	-	-	-	-	-
Foster-Glocester	Ponaganset High School	17.31	5.84	27.70	23.61	22.39	18.26
Foster-Glocester	Ponaganset Middle School	-	-	-	-	-	-
Glocester	Fogarty Memorial School	-	-	-	-	-	-
Glocester	West Glocester Elementary	28.69	18.05	45.90	27.39	10.22	18.26
Jamestown	Jamestown School-Lawn	19.16	15.15	30.00	54.52	11.16	18.26
Jamestown	Jamestown School-Melrose	41.46	20.98	30.00	16.44	11.78	18.26
Johnston	Thornton School	47.06	23.89	75.29	12.87	6.52	18.26
Johnston	Winsor Hill School	103.74	29.66	176.58	13.60	10.68	18.26
Johnston	Brown Avenue School	42.41	29.55	67.85	19.94	9.01	18.26
Johnston	Sarah Dyer Barnes School	50.00	54.10	80.00	18.34	9.73	18.26
Johnston	Nicholas A. Ferri Middle School / Early Childhood	-	-	-	-	-	-
Johnston	Johnston Senior High School	24.05	40.55	38.47	3.50	15.39	18.26
Johnston	Graniteville School	59.50	43.73	95.20	43.95	13.45	18.26
Lincoln	Lonsdale Elementary School	48.88	31.82	60.00	36.77	14.95	18.26
Lincoln	Lincoln Central Elementary School	63.87	35.58	30.00	39.06	24.75	18.26
Lincoln	Lincoln Senior High School	24.82	31.67	60.00	38.89	13.01	18.26
Lincoln	Northern Lincoln Elementary School	65.49	56.64	60.00	53.48	55.01	18.26
Lincoln	Saylesville Elementary School	93.39	40.59	60.00	37.38	52.32	18.26
Lincoln	Lincoln Middle School	-	-	-	-	-	-
Little Compton	Wilbur and McMahon School	-	-	-	-	-	-
Middletown	Aquidneck School	46.95	48.55	75.12	19.97	11.06	18.26
Middletown	Middletown High School	81.46	65.70	43.44	34.53	38.21	18.26
Middletown	Joseph H. Gaudet School	50.41	40.06	30.00	22.84	11.55	18.26
Middletown	Forest Avenue School	58.10	57.46	92.96	24.73	12.24	18.26
Narragansett	Narragansett Elementary School	36.18	76.18	57.89	21.90	14.04	18.26
Narragansett	Narragansett High School	30.37	10.34	48.59	20.29	12.74	18.26
Narragansett	Narragansett Pier Middle School	98.34	67.61	157.35	19.57	15.30	18.26
New Shoreham	Block Island School	9.79	11.52	30.93	8.15	18.50	15.57
Newport	Frank E. Thompson Middle School	28.23	26.41	45.17	13.09	33.25	18.26
Newport	Rogers High School	36.84	35.99	19.65	25.50	28.31	18.26
Newport	Claiborne Pell Elementary School	-	-	-	-	-	-
North Kingstown	Wickford Middle School	41.44	20.90	82.89	38.03	29.16	18.26
North Kingstown	Fishing Cove Elementary School	82.54	56.58	165.07	28.95	28.56	18.26
North Kingstown	North Kingstown Senior High School	14.15	3.91	37.72	20.10	39.69	18.26
North Kingstown	Forest Park Elementary School	153.20	41.72	306.40	26.81	30.80	18.26

District Name	Campus Name	Install Building Automation System Years	Install Dedicated Outdoor Air System	Install Solar Assisted Hot Water	Install LED Lighting	Install Ground Source Heat Pumps	Install Solar Panel or Wind Power Generator
North Kingstown	Stony Lane Elementary School	64.13	23.67	128.26	26.89	24.77	18.26
North Kingstown	Davisville Middle School	44.64	29.75	79.37	39.49	25.99	18.26
North Kingstown	Hamilton Elementary School	38.59	42.58	102.91	33.14	21.14	18.26
North Kingstown	Suzanne M. Henseler Quidnessett Elementary School	82.34	27.85	164.67	26.68	26.44	18.26
North Kingstown	Davisville Academy	-	-	-	-	-	-
North Providence	James L. McGuire School	49.74	37.96	79.58	33.65	13.96	18.26
North Providence	Marieville Elementary School	67.29	52.07	53.83	84.38	21.46	18.26
North Providence	North Providence High School	29.29	5.21	39.93	24.66	30.51	18.26
North Providence	Stephen Olney School	62.17	47.47	99.48	47.52	19.75	18.26
North Providence	Dr. Joseph A Whelan Elementary School	105.33	64.57	168.53	34.18	27.13	18.26
North Providence	Centredale School	75.59	48.60	120.95	30.54	21.74	18.26
North Providence	Greystone School	78.63	48.77	125.81	36.11	28.32	18.26
North Providence	Birchwood Middle School	57.12	22.66	30.00	50.93	11.65	18.26
North Providence	Dr. Edward A. Ricci Middle School	34.86	61.11	55.77	28.08	16.03	18.26
North Smithfield	North Smithfield Middle School	18.17	7.95	29.08	14.88	23.25	18.26
North Smithfield	Dr. Harry L. Halliwell Memorial School	55.05	33.30	88.08	22.95	18.73	18.26
North Smithfield	North Smithfield High School	10.99	37.26	17.59	29.41	17.35	18.26
North Smithfield	North Smithfield Elementary School	34.11	35.49	27.29	25.22	13.99	18.26
Pawtucket	Samuel Slater Junior High School	37.84	32.70	30.27	25.37	31.60	18.26
Pawtucket	Nathanael Greene School	41.39	51.91	66.23	40.44	30.20	18.26
Pawtucket	Potter-Burns School	117.57	47.12	188.11	41.08	31.60	18.26
Pawtucket	William E Tolman Senior High School	10.11	21.70	16.17	32.24	16.90	18.26
Pawtucket	Goff Junior High School	43.68	58.28	46.60	49.43	31.70	18.26
Pawtucket	Charles E. Shea Senior High School	14.35	48.01	22.96	30.19	31.60	18.26
Pawtucket	Fallon Memorial School	39.07	39.96	62.51	22.89	32.10	18.26
Pawtucket	Flora S. Curtis Memorial School	30.75	43.96	49.21	31.71	13.70	18.26
Pawtucket	Henry J. Winters School	41.22	25.91	41.22	22.55	13.20	18.26
Pawtucket	Elizabeth Baldwin School	186.20	68.09	34.77	14.32	17.80	18.26
Pawtucket	M. Virginia Cunningham School	-	-	-	-	-	-
Pawtucket	Agnes E. Little School	-	-	-	-	-	-
Pawtucket	Francis J. Varieur School	64.20	48.08	102.72	17.50	13.70	18.26
Pawtucket	Curvin-McCabe School	74.49	47.98	119.19	11.92	13.10	18.26
Pawtucket	Joseph Jenks Junior High School / JMW Arts HS	113.37	41.09	60.46	14.98	47.30	18.26
Portsmouth	Howard Hathaway School	20.36	29.30	32.58	22.00	11.20	18.26
Portsmouth	Portsmouth High School	20.71	22.15	16.57	24.52	21.82	18.26
Portsmouth	Melville Elementary School	48.18	52.80	77.09	23.16	24.13	18.26
Portsmouth	Portsmouth Middle School	18.69	16.50	19.94	13.99	21.44	18.26
Providence	Asa Messer Elementary School	-	-	-	-	-	-
Providence	Alan Shawn Feinstein Elementary at Broad Street	-	-	-	-	-	-
Providence	William D'Abate Elementary School	30.00	61.33	40.00	22.13	13.33	18.26
Providence	Alfred Lima Sr. Elementary School	53.25	28.17	42.60	13.94	10.10	18.26
Providence	Charles N. Fortes Elementary School	172.41	57.46	344.83	37.37	22.96	18.26
Providence	Webster Avenue School	25.22	34.81	40.35	23.94	13.63	18.26
Providence	George J. West Elementary School	-	-	-	-	-	-
Providence	Lillian Feinstein Elementary	24.22	33.42	38.75	28.88	16.77	18.26
Providence	Esek Hopkins Middle School	31.57	57.75	33.67	35.00	21.26	18.26
Providence	Robert L. Bailey IV Elementary School	59.78	55.90	95.65	16.78	25.76	18.26
Providence	Mary E. Fogarty Elementary School	-	-	-	-	-	-
Providence	Carl G. Lauro Elementary School	33.99	87.07	33.99	58.65	26.03	18.26
Providence	Robert F. Kennedy Elementary School	58.45	55.11	93.51	24.65	33.85	18.26
Providence	Nathan Bishop Middle School	-	-	-	-	-	-
Providence	Gilbert Stuart Middle School	28.95	32.06	23.16	25.62	24.91	18.26
Providence	Nathanael Greene Middle School	36.60	29.95	19.52	72.65	16.84	18.26
Providence	Roger Williams Middle School	26.01	33.54	20.81	23.67	22.80	18.26

District Name	Campus Name	Install Building Automation System Years	Install Dedicated Outdoor Air System	Install Solar Assisted Hot Water	Install LED Lighting	Install Ground Source Heat Pumps	Install Solar Panel or Wind Power Generator
Providence	Hope High School / 360 High School	26.49	17.35	14.13	34.69	13.83	18.26
Providence	Mount Pleasant High School / Evolutions HS	26.02	26.79	13.88	37.26	28.13	18.26
Providence	Veazie Street School	75.08	39.72	40.04	26.59	28.64	18.26
Providence	Harry Kizirian Elementary School	19.79	42.46	31.66	36.15	18.32	18.26
Providence	Pleasant View School	169.22	130.41	270.75	21.48	145.63	18.26
Providence	Dr. Martin Luther King Jr. Elementary School	-	-	-	-	-	-
Providence	Central High School	15.49	6.79	8.26	5.99	34.30	18.26
Providence	Classical High School	8.69	14.05	-	7.21	29.30	18.26
Providence	Reservoir Avenue School	79.20	94.40	126.72	26.26	216.97	18.26
Providence	Anthony Carnevale Elementary School	55.64	38.16	89.02	10.59	9.15	18.26
Providence	Governor Christopher DeSesto Middle School	23.38	7.72	37.41	13.45	19.32	18.26
Providence	Sgt. Cornel Young& Charlotte Woods Elementary School	29.43	33.68	47.09	11.79	10.85	18.26
Providence	William B. Cooley Senior High School	88.33	41.18	47.11	30.23	31.96	18.26
Providence	Vartan Gregorian Elementary School	24.64	64.16	39.43	25.55	17.06	18.26
Providence	E-Cubed Academy	20.12	63.05	154.01	11.98	29.13	18.26
Providence	Dr. Jorge Alvarez High School	32.47	28.76	64.94	16.86	17.72	18.26
Providence	Frank D. Spaziano Elementary School	52.64	64.35	42.11	71.15	16.84	18.26
Providence	Frank D. Spaziano Elementary School Annex	124.03	208.63	198.45	27.42	13.95	18.26
Providence	Leviton Dual Language School	139.56	99.10	223.30	14.93	12.47	18.26
Providence	Academy for Career Exploration (ACE)	-	-	-	-	-	-
Providence	Times2 Academy	-	-	-	-	-	-
Providence	West Broadway Middle School	-	-	-	-	-	-
Providence	Providence Career and Technical Academy	-	-	-	-	-	-
Scituate	Hope Elementary School	30.45	46.06	60.89	38.63	15.15	18.26
Scituate	Clayville Elementary School	38.56	26.96	30.00	23.33	14.20	18.26
Scituate	Scituate Middle School & High School	24.06	33.19	16.04	33.11	15.94	18.26
Scituate	North Scituate Elementary School	25.48	34.39	50.96	29.34	11.01	18.26
Smithfield	William Winsor School	23.74	18.92	37.99	24.92	8.36	18.26
Smithfield	Old County Road School	33.61	24.27	53.78	29.62	54.40	18.26
Smithfield	Anna M. McCabe School	23.47	17.96	37.55	24.67	35.60	18.26
Smithfield	Smithfield Senior High School	16.76	18.99	17.88	17.59	10.19	18.26
Smithfield	Raymond C. LaPerche School	21.49	15.75	34.38	20.75	31.30	18.26
Smithfield	Vincent J. Gallagher Middle School	30.91	19.70	24.73	22.03	15.36	18.26
South Kingstown	Peace Dale Elementary School	116.40	69.38	30.00	35.65	50.60	18.26
South Kingstown	Wakefield Elementary School	-	-	-	-	-	-
South Kingstown	South Kingstown High School	52.44	42.24	30.00	41.21	38.97	18.26
South Kingstown	Matunuck School	-	-	-	-	-	-
South Kingstown	West Kingston Elementary School	17.33	17.76	35.53	7.05	14.62	18.26
South Kingstown	Curtis Corner Middle School	61.83	32.04	30.00	34.33	31.61	18.26
South Kingstown	Broad Rock Middle School	37.73	15.57	30.00	22.36	31.64	18.26
South Kingstown	South Kingstown Inclusionary Preschool	98.55	58.41	157.68	48.99	234.09	18.26
South Kingstown	Academic Success Academy	130.70	77.49	30.00	53.06	41.21	18.26
Tiverton	Walter E. Ranger School	-	-	-	-	-	-
Tiverton	Fort Barton School	-	-	-	-	-	-
Tiverton	Pocasset School	-	-	-	-	-	-
Tiverton	Tiverton High School	12.87	40.31	21.74	26.69	17.32	18.26
Tiverton	Tiverton Middle School	26.41	30.68	26.41	1.38	20.47	18.26
Warwick	Oakland Beach Elementary School	29.40	44.47	23.52	25.93	7.66	18.26
Warwick	Greenwood School	28.22	60.05	45.15	20.65	7.14	18.26
Warwick	Aldrich Junior High School	10.49	40.55	16.79	37.16	30.00	18.26
Warwick	Wyman School	21.20	31.82	33.92	20.88	6.44	18.26
Warwick	Gorton Junior High School	-	-	-	-	-	-
Warwick	E. G. Robertson School	42.88	54.15	30.00	3.50	10.97	18.26
Warwick	Randall Holden School	29.36	22.37	23.49	28.79	30.54	18.26

District Name	Campus Name	Install Building Automation System Years	Install Dedicated Outdoor Air System	Install Solar Assisted Hot Water	Install LED Lighting	Install Ground Source Heat Pumps	Install Solar Panel or Wind Power Generator
Warwick	Lippitt School	-	-	-	-	-	-
Warwick	Francis School	25.73	51.13	41.16	16.80	6.73	18.26
Warwick	Holliman School	26.51	51.77	42.41	18.78	7.61	18.26
Warwick	John Wickes School	34.42	48.69	27.54	31.87	11.10	18.26
Warwick	Sherman School	26.54	19.29	42.46	26.05	8.51	18.26
Warwick	Warwick Veterans Memorial HS	18.33	21.62	9.78	26.94	9.44	18.26
Warwick	Cedar Hill School	102.26	86.17	163.61	3.50	126.28	18.26
Warwick	Park School	226.38	60.74	362.21	12.31	11.61	18.26
Warwick	Warwick Neck School	39.40	48.40	63.04	18.90	8.53	18.26
Warwick	Pilgrim High School	40.05	44.27	30.00	3.50	12.59	18.26
Warwick	Harold F. Scott School	59.96	61.90	47.97	3.50	10.62	18.26
Warwick	Norwood School	34.29	41.87	27.43	16.89	7.54	18.26
Warwick	Drum Rock Early Childhood Center	-	-	-	-	-	-
Warwick	Winman Junior High School	-	-	-	-	-	-
Warwick	Toll Gate High School	31.69	20.00	17.00	18.08	17.50	18.26
Warwick	Cottrell F. Hoxsie School	32.09	64.93	51.34	22.13	8.42	18.26
West Warwick	John F. Horgan Elementary School	46.43	34.73	30.00	17.83	17.55	18.26
West Warwick	Maisie E. Quinn Elementary School	25.60	68.91	30.00	18.51	15.20	18.26
West Warwick	West Warwick Senior High School	43.34	9.02	30.00	17.60	20.00	18.26
West Warwick	John F. Deering Middle School	29.72	22.95	30.00	15.79	14.95	18.26
West Warwick	Greenbush Elementary School	47.81	16.05	30.00	14.03	14.61	18.26
West Warwick	Wakefield Hills Elementary School	75.68	80.83	30.00	29.63	58.49	18.26
Westerly	Bradford Elementary School	61.16	61.76	122.32	21.57	22.32	18.26
Westerly	Westerly High School	10.63	12.52	21.26	18.15	26.23	18.26
Westerly	State Street School	30.36	52.74	60.72	22.03	16.76	18.26
Westerly	Dunn's Corners School	26.98	84.53	79.74	29.54	24.78	18.26
Westerly	Springbrook Elementary School	54.06	49.24	108.12	19.66	24.49	18.26
Westerly	Westerly Middle School	19.74	-	26.32	16.08	15.74	18.26
Woonsocket	Harris School	63.77	16.81	30.00	25.17	27.12	18.26
Woonsocket	Governor Aram J. Pothier School	41.18	12.41	30.00	26.52	13.21	18.26
Woonsocket	Citizens Memorial School	25.11	54.73	30.00	40.92	12.63	18.26
Woonsocket	Bernon Heights School	16.74	38.41	30.00	31.82	8.17	18.26
Woonsocket	Globe Park School	23.30	61.35	30.00	28.44	11.79	18.26
Woonsocket	Kevin K. Coleman Elementary School	24.54	20.50	30.00	50.46	8.84	18.26
Woonsocket	Leo A. Savoie School	20.04	32.95	30.00	47.25	8.98	18.26
Woonsocket	Woonsocket High School	11.82	2.57	30.00	23.25	9.13	18.26
Woonsocket	Woonsocket Middle School - Hamlet/Nova	-	-	-	-	-	-
Woonsocket	Woonsocket Area Career & Technical Center	16.43	7.88	30.00	10.13	7.48	18.26

Appendix C: Summary of ECM Costs and EUI

Energy data not available for schools without ECM values.

District Name	Campus Name	Install Building Automation System	Install Dedicated Outdoor Air System	Install Solar Assisted Hot Water	Install LED Lighting	Install Ground Source Heat Pumps	Install Solar Panel or Wind Power Generator	2014 EUI KBTU/SF
Barrington	Barrington High School	\$ 45,000	\$ 70,500	\$ 60,000	\$ 661,500	\$ 3,801,480	\$ 2,072,037	62.00
Barrington	Nayatt School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 119,000	\$ 683,550	\$ 334,403	71.55
Barrington	Primrose Hill School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 126,000	\$ 1,099,370	\$ -	80.23
Barrington	Hampden Meadows School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 172,725	\$ 992,775	\$ 620,137	70.33
Barrington	Sowams Elementary School	\$ 15,000	\$ 35,250	\$ 60,000	\$ 102,550	\$ 589,155	\$ 317,131	85.62
Barrington	Barrington Middle School	\$ 30,000	\$ 35,250	\$ 60,000	\$ 498,750	\$ 2,867,700	\$ 1,070,500	56.06
Bristol Warren	Colt Andrews School	\$ 15,000	\$ 47,000	\$ 120,000	\$ 248,581	\$ 1,428,945	\$ 998,247	63.27
Bristol Warren	Guiteras School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 135,356	\$ 777,945	\$ 402,012	54.22
Bristol Warren	Rockwell School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 102,200	\$ 247,380	\$ 430,752	76.37
Bristol Warren	Kickemuit Middle School	\$ 45,000	\$ -	\$ 60,000	\$ 506,937	\$ 2,916,480	\$ 2,038,959	67.88
Bristol Warren	Mt. Hope High School	\$ 30,000	\$ 70,500	\$ 60,000	\$ 622,062	\$ 3,460,065	\$ 1,819,905	65.77
Bristol Warren	Hugh Cole School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 295,855	\$ 1,699,100	\$ 1,104,698	58.99
Burrillville	William L. Callahan School	\$ 15,000	\$ 35,250	\$ 60,000	\$ 239,750	\$ 1,529,850	\$ 758,620	47.91
Burrillville	Austin T. Levy School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 149,100	\$ 856,065	\$ 524,292	65.30
Burrillville	Burrillville High School	\$ 30,000	\$ 82,250	\$ 60,000	\$ 805,000	\$ 4,628,610	\$ 2,869,155	48.93
Burrillville	Burrillville Middle School	\$ 22,500	\$ 35,250	\$ 60,000	\$ 441,000	\$ 2,535,645	\$ 1,205,402	26.43
Burrillville	Steere Farm Elementary School	\$ 22,500	\$ 35,250	\$ 60,000	\$ 441,000	\$ 2,535,645	\$ 1,205,402	63.57
Central Falls	Ella Risk School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 179,351	\$ 1,044,855	\$ 832,402	56.94
Central Falls	Margaret I. Robertson School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 138,142	\$ 794,220	\$ 409,251	47.38
Central Falls	Central Falls Senior High School	\$ 30,000	\$ 35,250	\$ 60,000	\$ 394,244	\$ 5,145,139	\$ -	81.26
Central Falls	Capt. G. Harold Hunt School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 64,050	\$ 449,190	\$ 384,297	77.37
Central Falls	Dr. Earl F. Calcutt Middle School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 313,600	\$ 1,803,270	\$ 1,090,515	48.90
Central Falls	Veterans Memorial Elementary	\$ 15,000	\$ 11,750	\$ 60,000	\$ 186,585	\$ 1,074,150	\$ 839,087	73.93
Chariho	Hope Valley Elementary School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 100,573	\$ 595,665	\$ 325,001	73.59
Chariho	Richmond Elementary School	\$ 15,000	\$ 35,250	\$ 60,000	\$ 193,550	\$ 1,061,130	\$ 646,278	78.18
Chariho	Chariho Regional High School	\$ 30,000	\$ 70,500	\$ 60,000	\$ 407,750	\$ 2,343,600	\$ 1,835,708	61.77
Chariho	Ashaway Elementary School	\$ 15,000	\$ 35,250	\$ 60,000	\$ 125,125	\$ 618,450	\$ 411,972	76.35
Chariho	Charlestown Elementary School	\$ 15,000	\$ 47,000	\$ 60,000	\$ 189,823	\$ 1,018,815	\$ 741,826	65.04
Chariho	Chariho Regional Middle School	\$ 30,000	\$ 11,750	\$ 60,000	\$ 496,090	\$ 2,656,080	\$ 2,434,831	57.18
Chariho	The R.Y.S.E. School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 42,000	\$ 250,635	\$ 245,059	24.23
Chariho	Chariho Area Career & Technical Center	\$ 15,000	\$ 23,500	\$ 60,000	\$ 143,500	\$ 823,515	\$ 850,019	81.66
Charter	Segue Institute for Learning	\$ 15,000	\$ 23,500	\$ 60,000	\$ 8,350	\$ 813,750	\$ 575,233	79.56
Charter	Beacon Charter School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 135,800	\$ 790,965	\$ 566,320	57.57
Charter	The Greene School	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00
Charter	International Charter School	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00
Charter	The Compass School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 21,000	\$ 123,690	\$ 157,388	61.43
Charter	RISE Prep Mayoral Academy	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00
Charter	The Learning Community	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	37.25
Charter	Nowell Leadership Academy - Central Campus	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00
Charter	Kingston Hill Academy	\$ 15,000	\$ 11,750	\$ 60,000	\$ 48,111	\$ 279,930	\$ 323,625	28.63
Charter	Nowell Leadership Academy - Capital Campus	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00
Charter	Highlander Charter School - Lower School (Providence)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00
Charter	Highlander Charter School - Upper School (Warren)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00
Charter	Village Green Virtual Charter School	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00
Charter	Rhode Island Nurses Institute Middle College	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00
Charter	Trinity Academy for the Performing Arts	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	58.20
Charter	SouthSide Elementary Charter School	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00
Charter	Achievement First Illuminar/Providence Mayoral Acad	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00
Charter	Paul Cuffee Charter School - Lower School	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	69.97
Charter	Paul Cuffee Charter School - Upper School	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	79.30
Charter	Paul Cuffee Charter School - Middle School	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	84.99
Charter	Founders Academy	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00
Charter	Blackstone Academy Charter School	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	27.45
Charter	Blackstone Valley Prep Elementary School 1	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00
Charter	Blackstone Valley Prep Elementary School 2	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	39.12
Charter	Blackstone Valley Prep Elementary School 3	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00
Charter	Blackstone Valley Prep High School	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00
Charter	Blackstone Valley Prep Middle School 1	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	90.76

District Name	Campus Name	Install Building Automation System	Install Dedicated Outdoor Air System	Install Solar Assisted Hot Water	Install LED Lighting	Install Ground Source Heat Pumps	Install Solar Panel or Wind Power Generator	2014 EUI KBTU/SF
Charter	The Hope Academy	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00
Charter	Rhode Island School for the Deaf	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	26.96
Charter	Davies Career and Technical Center	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	56.90
Charter	The Met Public Street School	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00
Charter	The Met East Bay School	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00
Charter	The Met Peace Street School	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00
Coventry	Western Coventry School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 147,700	\$ 849,555	\$ 1,250,074	37.87
Coventry	Alan Shawn Feinstein Middle School Of Coventry	\$ 45,000	\$ 70,500	\$ 60,000	\$ 560,805	\$ 3,222,450	\$ 1,912,041	54.75
Coventry	Hopkins Hill School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 125,895	\$ 748,650	\$ 435,405	64.96
Coventry	Washington Oak School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 238,000	\$ 1,386,630	\$ 936,935	16.76
Coventry	Blackrock School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 140,455	\$ 807,240	\$ 1,403,166	42.53
Coventry	Tiogue School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 147,700	\$ 849,555	\$ 933,740	29.18
Coventry	Coventry High School	\$ 15,000	\$ 11,750	\$ 120,000	\$ 1,038,100	\$ 5,966,415	\$ 5,166,354	66.32
Cranston	Chester W. Barrows School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 94,724	\$ 543,585	\$ 205,280	46.71
Cranston	Daniel D. Waterman School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 84,438	\$ 429,660	\$ 214,242	53.84
Cranston	Cranston High School East	\$ 30,000	\$ 11,750	\$ 60,000	\$ 833,501	\$ 4,791,360	\$ 3,556,176	52.28
Cranston	Hugh B. Bain Middle School	\$ 45,000	\$ 47,000	\$ 60,000	\$ 464,800	\$ 2,672,355	\$ 891,011	57.85
Cranston	Edward S. Rhodes School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 8,350	\$ 706,335	\$ 196,038	52.40
Cranston	William R. Dutemple School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 119,753	\$ 686,805	\$ 241,067	57.86
Cranston	Oak Lawn School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 105,350	\$ 605,430	\$ 366,859	48.88
Cranston	Eden Park School	\$ 15,000	\$ 35,250	\$ 60,000	\$ 120,012	\$ 790,965	\$ 346,771	70.54
Cranston	Gladstone Street School	\$ 45,000	\$ 35,250	\$ 60,000	\$ 335,563	\$ 1,930,215	\$ 640,450	56.22
Cranston	Garden City School	\$ 15,000	\$ 35,250	\$ 60,000	\$ 116,151	\$ 667,275	\$ 354,766	73.33
Cranston	Woodridge School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 78,705	\$ 452,445	\$ 489,535	80.61
Cranston	Park View Middle School	\$ 15,000	\$ 47,000	\$ 60,000	\$ 588,756	\$ 3,385,200	\$ 1,228,795	68.94
Cranston	Stadium School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 120,442	\$ 693,315	\$ 326,948	48.88
Cranston	Arlington School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 64,743	\$ 371,070	\$ 491,072	77.24
Cranston	George J. Peters School	\$ 15,000	\$ 35,250	\$ 60,000	\$ 123,648	\$ 709,590	\$ 332,521	108.88
Cranston	Cranston High School West	\$ 15,000	\$ 58,750	\$ 60,000	\$ 528,913	\$ 3,040,170	\$ 2,681,053	59.16
Cranston	Stone Hill School	\$ 15,000	\$ 35,250	\$ 60,000	\$ 126,000	\$ 742,140	\$ 284,855	52.09
Cranston	Glen Hills School	\$ 15,000	\$ 35,250	\$ 60,000	\$ 142,800	\$ 725,865	\$ 296,144	54.36
Cranston	Edgewood Highland School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 154,837	\$ 888,615	\$ 701,156	67.60
Cranston	Western Hills Middle School	\$ 15,000	\$ 58,750	\$ 60,000	\$ 452,358	\$ 2,600,745	\$ 1,409,617	62.93
Cranston	Hope Highlands Elementary School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 240,450	\$ 1,380,000	\$ 811,972	67.77
Cranston	Orchard Farms Elementary School	\$ 30,000	\$ 47,000	\$ 60,000	\$ 236,600	\$ 1,376,865	\$ 858,463	53.90
Cranston	Nel/CPS Construction Career Academy	\$ 15,000	\$ 23,500	\$ 60,000	\$ 161,595	\$ 927,675	\$ 1,003,306	35.92
Cranston	Cranston Area Career & Technical Center	\$ 15,000	\$ 11,750	\$ 60,000	\$ 68,450	\$ 393,855	\$ 818,201	56.34
Cumberland	Community School	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	45.82
Cumberland	Garvin Memorial School	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	79.70
Cumberland	John J. McLaughlin Cumberland Hill School	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	83.59
Cumberland	Ashton School / Cumberland Pre-K Center	\$ 15,000	\$ 11,750	\$ 60,000	\$ 132,850	\$ 764,925	\$ 382,393	91.10
Cumberland	Cumberland High School	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	81.07
Cumberland	Joseph L. McCourt Middle School	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	59.69
Cumberland	North Cumberland Middle School	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	55.89
Cumberland	B.F. Norton Elementary School	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	73.68
East Greenwich	Frenchtown School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 150,749	\$ 865,830	\$ 673,352	119.66
East Greenwich	James H. Eldredge El. School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 126,000	\$ 725,865	\$ 471,452	83.89
East Greenwich	Archie R. Cole Middle School	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	70.41
East Greenwich	George Hanaford School	\$ 15,000	\$ 35,250	\$ 60,000	\$ 108,539	\$ 624,960	\$ 607,580	95.50
East Greenwich	East Greenwich High School	\$ 30,000	\$ 11,750	\$ 60,000	\$ 649,950	\$ 3,199,665	\$ 673,352	55.31
East Greenwich	Meadowbrook Farms School	\$ 15,000	\$ 35,250	\$ 60,000	\$ 145,464	\$ 836,535	\$ 620,457	117.52
East Providence	Kent Heights School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 112,917	\$ 647,745	\$ 341,151	77.07
East Providence	James R. D. Oldham School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 118,055	\$ 677,040	\$ 523,014	97.88
East Providence	East Providence High School	\$ 45,000	\$ 70,500	\$ 120,000	\$ 875,000	\$ 6,842,010	\$ 1,849,973	75.31
East Providence	Alice M. Waddington School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 209,836	\$ 1,207,605	\$ 1,200,968	34.43
East Providence	Agnes B. Hennessey School	\$ 15,000	\$ 35,250	\$ 60,000	\$ 121,958	\$ 699,825	\$ 363,130	108.95
East Providence	Emma G. Whiteknact School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 133,249	\$ 764,925	\$ 379,763	70.86
East Providence	Riverside Middle School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 457,450	\$ 2,630,040	\$ 1,033,644	69.76

District Name	Campus Name	Install Building Automation System	Install Dedicated Outdoor Air System	Install Solar Assisted Hot Water	Install LED Lighting	Install Ground Source Heat Pumps	Install Solar Panel or Wind Power Generator	2014 EUI KBTU/SF
East Providence	Silver Spring School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 117,950	\$ 677,040	\$ 331,781	72.73
East Providence	Orlo Avenue School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 113,803	\$ 654,255	\$ 289,498	69.99
East Providence	Edward R. Martin Middle School	\$ 45,000	\$ 47,000	\$ 60,000	\$ 583,349	\$ 3,352,650	\$ 3,304,767	117.27
East Providence	Myron J. Francis Elementary School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 8,350	\$ 1,015,560	\$ 333,772	59.37
East Providence	East Providence Career & Technical Center	\$ 15,000	\$ 11,750	\$ 60,000	\$ 150,784	\$ 914,655	\$ 818,100	87.99
Exeter-West Greenwich	Mildred E. Lineham School	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	2.50
Exeter-West Greenwich	Wawaloam School	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	43.65
Exeter-West Greenwich	Metcalf School	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	69.97
Exeter-West Greenwich	Exeter-West Greenwich Regional Junior High	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00
Exeter-West Greenwich	Exeter-West Greenwich Regional High School	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	44.94
Foster	Captain Isaac Paine Elementary School	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	59.10
Foster-Glocester	Ponaganset High School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 1,003,538	\$ 4,557,000	\$ 3,317,845	26.07
Foster-Glocester	Ponaganset Middle School	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	35.93
Glocester	Fogarty Memorial School	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	63.61
Glocester	West Glocester Elementary	\$ 15,000	\$ 11,750	\$ 60,000	\$ 189,000	\$ 1,087,170	\$ 630,137	52.64
Jamestown	Jamestown School-Lawn	\$ 15,000	\$ 11,750	\$ 60,000	\$ 274,072	\$ 1,096,935	\$ 459,095	67.19
Jamestown	Jamestown School-Melrose	\$ 15,000	\$ 11,750	\$ 60,000	\$ 126,620	\$ 1,080,660	\$ 703,397	42.72
Johnston	Thornton School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 101,714	\$ 524,055	\$ 615,452	60.57
Johnston	Winsor Hill School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 120,029	\$ 690,060	\$ 700,639	54.62
Johnston	Brown Avenue School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 70,399	\$ 403,620	\$ 322,374	89.33
Johnston	Sarah Dyer Barnes School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 120,029	\$ 690,060	\$ 509,826	52.82
Johnston	Nicholas A. Ferri Middle School / Early Childhood	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	53.67
Johnston	Johnston Senior High School	\$ 15,000	\$ 58,750	\$ 60,000	\$ 642,733	\$ 3,671,640	\$ 2,388,840	43.12
Johnston	Graniteville School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 70,000	\$ 403,620	\$ 193,918	61.86
Lincoln	Lonsdale Elementary School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 102,300	\$ 550,095	\$ 338,795	91.83
Lincoln	Lincoln Central Elementary School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 120,400	\$ 690,060	\$ 375,342	67.66
Lincoln	Lincoln Senior High School	\$ 30,000	\$ 58,750	\$ 60,000	\$ 737,800	\$ 2,031,120	\$ 2,310,046	58.98
Lincoln	Northern Lincoln Elementary School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 260,050	\$ 1,494,045	\$ 592,110	34.22
Lincoln	Saylesville Elementary School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 126,350	\$ 725,865	\$ 411,580	49.27
Lincoln	Lincoln Middle School	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	39.74
Little Compton	Wilbur and McMahon School	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	24.61
Middletown	Aquidneck School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 152,250	\$ 875,595	\$ 595,196	74.94
Middletown	Middletown High School	\$ 45,000	\$ 70,500	\$ 60,000	\$ 455,000	\$ 2,617,020	\$ 1,604,402	48.83
Middletown	Joseph H. Gaudet School	\$ 45,000	\$ 58,750	\$ 60,000	\$ 485,450	\$ 2,789,535	\$ 1,941,005	65.34
Middletown	Forest Avenue School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 141,999	\$ 817,005	\$ 524,475	66.38
Narragansett	Narragansett Elementary School	\$ 15,000	\$ 58,750	\$ 60,000	\$ 309,082	\$ 1,777,230	\$ 1,120,822	52.51
Narragansett	Narragansett High School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 414,750	\$ 2,382,660	\$ 1,866,466	52.12
Narragansett	Narragansett Pier Middle School	\$ 15,000	\$ 47,000	\$ 60,000	\$ 303,100	\$ 1,744,680	\$ 1,414,466	33.57
New Shoreham	Block Island School	\$ 30,000	\$ 23,500	\$ 60,000	\$ 237,650	\$ 1,500,000	\$ 943,611	86.85
Newport	Frank E. Thompson Middle School	\$ 15,000	\$ 35,250	\$ 60,000	\$ 392,000	\$ 2,252,460	\$ 2,279,295	62.52
Newport	Rogers High School	\$ 45,000	\$ 58,750	\$ 60,000	\$ 560,000	\$ 3,210,000	\$ 1,744,146	57.77
Newport	Claiborne Pell Elementary School	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	40.54
North Kingstown	Wickford Middle School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 221,200	\$ 1,272,705	\$ 708,174	49.84
North Kingstown	Fishing Cove Elementary School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 161,560	\$ 927,675	\$ 679,555	49.24
North Kingstown	North Kingstown Senior High School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 887,600	\$ 5,168,940	\$ 5,378,301	59.07
North Kingstown	Forest Park Elementary School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 111,650	\$ 641,235	\$ 507,005	43.88
North Kingstown	Stony Lane Elementary School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 172,550	\$ 992,775	\$ 781,473	57.02
North Kingstown	Davisville Middle School	\$ 22,500	\$ 35,250	\$ 60,000	\$ 338,625	\$ 1,946,490	\$ 1,044,164	54.35
North Kingstown	Hamilton Elementary School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 172,550	\$ 992,775	\$ 634,004	78.44
North Kingstown	Suzanne M. Henseler Quidnessett Elementary School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 152,250	\$ 875,595	\$ 694,740	67.50
North Kingstown	Davisville Academy	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00
North Providence	James L. McGuire School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 87,500	\$ 504,525	\$ 202,941	105.86
North Providence	Marieville Elementary School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 98,700	\$ 566,370	\$ 142,429	69.04
North Providence	North Providence High School	\$ 30,000	\$ 11,750	\$ 120,000	\$ 732,900	\$ 4,211,970	\$ 3,618,594	59.95
North Providence	Stephen Olney School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 98,700	\$ 566,370	\$ 162,119	73.45
North Providence	Dr. Joseph A Whelan Elementary School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 80,150	\$ 462,210	\$ 183,050	59.26
North Providence	Centredale School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 88,550	\$ 507,780	\$ 226,355	73.21
North Providence	Greystone School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 110,250	\$ 634,725	\$ 238,338	57.49

District Name	Campus Name	Install Building Automation System	Install Dedicated Outdoor Air System	Install Solar Assisted Hot Water	Install LED Lighting	Install Ground Source Heat Pumps	Install Solar Panel or Wind Power Generator	2014 EUI KBTU/SF
North Providence	Birchwood Middle School	\$ 22,500	\$ 11,750	\$ 60,000	\$ 227,150	\$ 576,135	\$ 543,087	58.49
North Providence	Dr. Edward A. Ricci Middle School	\$ 15,000	\$ 35,250	\$ 60,000	\$ 222,600	\$ 869,085	\$ 618,776	65.69
North Smithfield	North Smithfield Middle School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 399,000	\$ 2,353,365	\$ 2,092,538	55.01
North Smithfield	Dr. Harry L. Halliwell Memorial School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 106,313	\$ 611,940	\$ 361,526	63.35
North Smithfield	North Smithfield High School	\$ 15,000	\$ 58,750	\$ 60,000	\$ 507,500	\$ 2,916,480	\$ 1,347,000	48.68
North Smithfield	North Smithfield Elementary School	\$ 30,000	\$ 35,250	\$ 60,000	\$ 262,500	\$ 1,510,320	\$ 812,455	96.41
Pawtucket	Samuel Slater Junior High School	\$ 30,000	\$ 35,250	\$ 60,000	\$ 382,445	\$ 2,197,125	\$ 1,176,844	70.86
Pawtucket	Nathanael Greene School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 228,260	\$ 1,311,765	\$ 440,590	52.45
Pawtucket	Potter-Burns School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 196,980	\$ 450,000	\$ 374,232	14.76
Pawtucket	William E Tolman Senior High School	\$ 15,000	\$ 35,250	\$ 60,000	\$ 514,500	\$ 2,958,795	\$ 1,245,755	90.67
Pawtucket	Goff Junior High School	\$ 22,500	\$ 35,250	\$ 60,000	\$ 345,625	\$ 1,985,550	\$ 532,180	48.07
Pawtucket	Charles E. Shea Senior High School	\$ 15,000	\$ 58,750	\$ 60,000	\$ 413,984	\$ 2,379,400	\$ 1,070,485	81.36
Pawtucket	Fallon Memorial School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 214,354	\$ 1,233,645	\$ 730,797	64.41
Pawtucket	Flora S. Curtis Memorial School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 166,950	\$ 817,000	\$ 410,959	91.52
Pawtucket	Henry J. Winters School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 126,966	\$ 729,120	\$ 439,522	97.27
Pawtucket	Elizabeth Baldwin School	\$ 15,000	\$ 35,250	\$ 60,000	\$ 204,316	\$ 1,087,555	\$ 1,113,657	30.28
Pawtucket	M. Virginia Cunningham School	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-0.23
Pawtucket	Agnes E. Little School	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00
Pawtucket	Francis J. Varieur School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 171,220	\$ 817,000	\$ 763,657	57.00
Pawtucket	Curvin-McCabe School	\$ 15,000	\$ 28,750	\$ 60,000	\$ 166,663	\$ 956,970	\$ 1,091,520	61.54
Pawtucket	Joseph Jenks Junior High School / JMW Arts HS	\$ 45,000	\$ 47,000	\$ 60,000	\$ 395,500	\$ 2,271,990	\$ 2,060,495	50.14
Portsmouth	Howard Hathaway School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 175,700	\$ 1,009,050	\$ 607,817	73.25
Portsmouth	Portsmouth High School	\$ 30,000	\$ 47,000	\$ 60,000	\$ 795,375	\$ 3,892,980	\$ 2,520,913	64.24
Portsmouth	Melville Elementary School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 156,800	\$ 901,635	\$ 515,324	69.30
Portsmouth	Portsmouth Middle School	\$ 22,500	\$ 35,250	\$ 60,000	\$ 552,300	\$ 3,173,625	\$ 3,004,840	83.87
Providence	Asa Messer Elementary School	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	49.61
Providence	Alan Shawn Feinstein Elementary at Broad Street	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	66.80
Providence	William D'Abate Elementary School	\$ 15,000	\$ 35,250	\$ 60,000	\$ 140,000	\$ 803,985	\$ 492,689	113.78
Providence	Alfred Lima Sr. Elementary School	\$ 30,000	\$ 35,250	\$ 60,000	\$ 361,200	\$ 2,076,690	\$ 2,018,520	67.26
Providence	Charles N. Fortes Elementary School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 180,480	\$ 1,135,995	\$ 588,151	24.95
Providence	Webster Avenue School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 171,500	\$ 986,265	\$ 557,971	60.93
Providence	George J. West Elementary School	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	61.94
Providence	Lillian Feinstein Elementary	\$ 15,000	\$ 23,500	\$ 60,000	\$ 220,500	\$ 1,266,195	\$ 581,037	61.81
Providence	Esek Hopkins Middle School	\$ 22,500	\$ 47,000	\$ 60,000	\$ 305,666	\$ 1,852,095	\$ 680,277	74.43
Providence	Robert L Bailey IV Elementary School	\$ 15,000	\$ 35,250	\$ 60,000	\$ 232,050	\$ 1,334,550	\$ 1,077,252	49.88
Providence	Mary E. Fogarty Elementary School	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	76.05
Providence	Carl G. Lauro Elementary School	\$ 30,000	\$ 94,000	\$ 60,000	\$ 490,000	\$ 2,815,575	\$ 1,017,231	64.67
Providence	Robert F. Kennedy Elementary School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 180,306	\$ 1,035,090	\$ 569,737	53.11
Providence	Nathan Bishop Middle School	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	66.53
Providence	Gilbert Stuart Middle School	\$ 30,000	\$ 47,000	\$ 60,000	\$ 551,600	\$ 3,170,370	\$ 1,677,168	43.33
Providence	Nathanael Greene Middle School	\$ 45,000	\$ 35,250	\$ 60,000	\$ 567,560	\$ 3,261,510	\$ 620,347	65.01
Providence	Roger Williams Middle School	\$ 30,000	\$ 58,750	\$ 60,000	\$ 656,250	\$ 3,232,215	\$ 2,159,319	62.97
Providence	Hope High School / 360 High School	\$ 45,000	\$ 35,250	\$ 60,000	\$ 805,749	\$ 4,631,865	\$ 1,844,603	0.00
Providence	Mount Pleasant High School / Evolutions HS	\$ 45,000	\$ 58,750	\$ 60,000	\$ 1,043,700	\$ 5,998,965	\$ 2,181,615	55.06
Providence	Veazie Street School	\$ 45,000	\$ 35,250	\$ 60,000	\$ 364,000	\$ 2,092,965	\$ 1,066,435	58.19
Providence	Harry Kizirian Elementary School	\$ 15,000	\$ 35,250	\$ 60,000	\$ 295,750	\$ 1,699,110	\$ 637,155	80.57
Providence	Pleasant View School	\$ 15,000	\$ 58,750	\$ 60,000	\$ 257,950	\$ 1,484,280	\$ 935,233	0.00
Providence	Dr. Martin Luther King Jr. Elementary School	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	135.50
Providence	Central High School	\$ 45,000	\$ 35,250	\$ 60,000	\$ 563,500	\$ 3,222,450	\$ 7,329,297	32.68
Providence	Classical High School	\$ 15,000	\$ 47,000	\$ 60,000	\$ 462,000	\$ 2,648,952	\$ 4,992,237	91.38
Providence	Reservoir Avenue School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 87,780	\$ 511,035	\$ 260,324	72.73
Providence	Anthony Carnevale Elementary School	\$ 15,000	\$ 35,250	\$ 60,000	\$ 238,868	\$ 1,389,885	\$ 1,716,203	62.76
Providence	Governor Christopher DelSesto Middle School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 431,200	\$ 2,509,605	\$ 2,533,005	66.46
Providence	Sgt. Cornel Young & Charlotte Woods Elementary School	\$ 15,000	\$ 35,250	\$ 60,000	\$ 245,000	\$ 969,990	\$ 1,618,043	86.06
Providence	William B. Cooley Senior High School	\$ 45,000	\$ 35,250	\$ 60,000	\$ 448,000	\$ 2,607,255	\$ 1,154,251	42.65
Providence	Vartan Gregorian Elementary School	\$ 15,000	\$ 47,000	\$ 60,000	\$ 220,500	\$ 1,266,195	\$ 672,181	90.10
Providence	E-Cubed Academy	\$ 15,000	\$ 35,250	\$ 60,000	\$ 165,672	\$ 953,715	\$ 1,076,906	49.62
Providence	Dr. Jorge Alvarez High School	\$ 15,000	\$ 35,250	\$ 60,000	\$ 296,450	\$ 1,507,065	\$ 2,140,786	74.15

District Name	Campus Name	Install Building Automation System	Install Dedicated Outdoor Air System	Install Solar Assisted Hot Water	Install LED Lighting	Install Ground Source Heat Pumps	Install Solar Panel or Wind Power Generator	2014 EUI KBTU/SF
Providence	Frank D. Spaziano Elementary School	\$ 30,000	\$ 35,250	\$ 60,000	\$ 262,500	\$ 1,510,320	\$ 292,986	36.25
Providence	Frank D. Spaziano Elementary School Annex	\$ 15,000	\$ 35,250	\$ 60,000	\$ 65,800	\$ 377,580	\$ 190,575	63.53
Providence	Leviton Dual Language School	\$ 15,000	\$ 35,250	\$ 60,000	\$ 125,930	\$ 722,610	\$ 669,973	46.42
Providence	Academy for Career Exploration (ACE)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00
Providence	Times2 Academy	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00
Providence	West Broadway Middle School	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	54.45
Providence	Providence Career and Technical Academy	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	37.10
Scituate	Hope Elementary School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 144,970	\$ 940,695	\$ 342,750	57.30
Scituate	Clayville Elementary School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 67,253	\$ 667,275	\$ 350,959	59.56
Scituate	Scituate Middle School & High School	\$ 45,000	\$ 70,500	\$ 60,000	\$ 636,881	\$ 3,658,620	\$ 1,756,833	42.62
Scituate	North Scituate Elementary School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 141,873	\$ 817,005	\$ 588,740	75.34
Smithfield	William Winsor School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 112,378	\$ 644,490	\$ 358,168	91.71
Smithfield	Old County Road School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 135,744	\$ 781,200	\$ 363,875	57.75
Smithfield	Anna M. McCabe School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 132,398	\$ 761,670	\$ 426,266	80.81
Smithfield	Smithfield Senior High School	\$ 45,000	\$ 58,750	\$ 120,000	\$ 582,960	\$ 3,378,690	\$ 2,631,365	83.24
Smithfield	Raymond C. LaPerche School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 141,575	\$ 813,750	\$ 541,930	84.83
Smithfield	Vincent J. Gallagher Middle School	\$ 30,000	\$ 23,500	\$ 60,000	\$ 314,258	\$ 1,829,310	\$ 1,132,808	58.27
South Kingstown	Peace Dale Elementary School	\$ 30,000	\$ 35,250	\$ 60,000	\$ 299,250	\$ 1,637,265	\$ 766,571	36.37
South Kingstown	Wakefield Elementary School	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	50.12
South Kingstown	South Kingstown High School	\$ 45,000	\$ 58,750	\$ 60,000	\$ 821,275	\$ 4,338,915	\$ 1,819,905	41.62
South Kingstown	Matunuck School	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	41.05
South Kingstown	West Kingstown Elementary School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 152,432	\$ 875,595	\$ 1,580,664	45.71
South Kingstown	Curtis Corner Middle School	\$ 30,000	\$ 23,500	\$ 60,000	\$ 338,440	\$ 1,953,000	\$ 900,224	50.98
South Kingstown	Broad Rock Middle School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 272,234	\$ 1,585,185	\$ 1,111,639	57.74
South Kingstown	South Kingstown Inclusionary Preschool	\$ 15,000	\$ 11,750	\$ 60,000	\$ 130,725	\$ 7,581,905	\$ 211,890	39.34
South Kingstown	Academic Success Academy	\$ 15,000	\$ 11,750	\$ 60,000	\$ 92,761	\$ 540,330	\$ 159,666	41.79
Tiverton	Walter E. Ranger School	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	84.83
Tiverton	Fort Barton School	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	90.18
Tiverton	Pocasset School	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	90.71
Tiverton	Tiverton High School	\$ 30,000	\$ 70,500	\$ 60,000	\$ 508,200	\$ 2,922,990	\$ 1,739,154	54.25
Tiverton	Tiverton Middle School	\$ 30,000	\$ 47,000	\$ 60,000	\$ 25,050	\$ 2,857,890	\$ 1,656,361	46.02
Warwick	Oakland Beach Elementary School	\$ 30,000	\$ 47,000	\$ 60,000	\$ 231,805	\$ 1,331,295	\$ 709,863	76.75
Warwick	Greenwood School	\$ 15,000	\$ 35,250	\$ 60,000	\$ 119,280	\$ 686,805	\$ 458,795	83.35
Warwick	Aldrich Junior High School	\$ 15,000	\$ 58,750	\$ 60,000	\$ 429,489	\$ 2,457,996	\$ 917,918	56.00
Warwick	Wyman School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 135,699	\$ 781,200	\$ 506,210	88.36
Warwick	Gorton Junior High School	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	44.35
Warwick	E. G. Robertson School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 8,350	\$ 777,645	\$ 417,863	85.14
Warwick	Randall Holden School	\$ 15,000	\$ 11,750	\$ 30,000	\$ 125,395	\$ 719,355	\$ 345,918	71.07
Warwick	Lippitt School	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00
Warwick	Francis School	\$ 15,000	\$ 35,250	\$ 60,000	\$ 132,430	\$ 761,670	\$ 613,991	96.30
Warwick	Holliman School	\$ 15,000	\$ 35,250	\$ 60,000	\$ 147,763	\$ 849,555	\$ 624,822	88.39
Warwick	John Wickes School	\$ 15,000	\$ 23,500	\$ 30,000	\$ 152,250	\$ 875,595	\$ 379,416	90.29
Warwick	Sherman School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 147,980	\$ 849,555	\$ 451,050	119.39
Warwick	Warwick Veterans Memorial HS	\$ 45,000	\$ 58,750	\$ 60,000	\$ 736,820	\$ 4,234,755	\$ 2,135,215	59.40
Warwick	Cedar Hill School	\$ 15,000	\$ 35,250	\$ 60,000	\$ 146,776	\$ 8,430,045	\$ 728,256	48.96
Warwick	Park School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 127,348	\$ 732,375	\$ 821,205	41.95
Warwick	Warwick Neck School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 117,936	\$ 677,040	\$ 487,160	107.52
Warwick	Pilgrim High School	\$ 45,000	\$ 94,000	\$ 60,000	\$ 25,050	\$ 4,407,270	\$ 3,118,612	58.13
Warwick	Harold F. Scott School	\$ 15,000	\$ 23,500	\$ 30,000	\$ 8,350	\$ 657,510	\$ 467,653	78.52
Warwick	Norwood School	\$ 15,000	\$ 23,500	\$ 30,000	\$ 120,722	\$ 693,315	\$ 567,726	120.97
Warwick	Drum Rock Early Childhood Center	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	95.44
Warwick	Winman Junior High School	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	74.09
Warwick	Toll Gate High School	\$ 45,000	\$ 47,000	\$ 60,000	\$ 716,174	\$ 4,117,575	\$ 3,145,828	59.78
Warwick	Cottrell F. Hoxsie School	\$ 15,000	\$ 35,250	\$ 60,000	\$ 130,550	\$ 748,650	\$ 468,402	103.63
West Warwick	John F. Horgan Elementary School	\$ 30,000	\$ 23,500	\$ 60,000	\$ 241,339	\$ 1,386,630	\$ 467,733	45.46
West Warwick	Maisie E. Quinn Elementary School	\$ 15,000	\$ 35,250	\$ 60,000	\$ 189,312	\$ 1,087,170	\$ 175,341	46.58
West Warwick	West Warwick Senior High School	\$ 45,000	\$ 11,750	\$ 60,000	\$ 458,871	\$ 2,636,550	\$ 1,277,682	79.12
West Warwick	John F. Deering Middle School	\$ 45,000	\$ 35,250	\$ 60,000	\$ 485,100	\$ 2,789,535	\$ 974,344	94.23

District Name	Campus Name	Install Building Automation System	Install Dedicated Outdoor Air System	Install Solar Assisted Hot Water	Install LED Lighting	Install Ground Source Heat Pumps	Install Solar Panel or Wind Power Generator	2014 EUI KBTU/SF
West Warwick	Greenbush Elementary School	\$ 30,000	\$ 11,750	\$ 60,000	\$ 205,468	\$ 1,181,565	\$ 636,888	59.96
West Warwick	Wakefield Hills Elementary School	\$ 15,000	\$ 35,250	\$ 60,000	\$ 258,416	\$ 1,503,810	\$ 700,009	35.87
Westerly	Bradford Elementary School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 113,050	\$ 651,000	\$ 478,694	85.30
Westerly	Westerly High School	\$ 15,000	\$ 47,000	\$ 60,000	\$ 792,603	\$ 4,557,000	\$ 3,988,810	70.08
Westerly	State Street School	\$ 15,000	\$ 35,250	\$ 60,000	\$ 175,000	\$ 1,005,795	\$ 725,387	96.30
Westerly	Dunn's Corners School	\$ 15,000	\$ 35,250	\$ 60,000	\$ 296,345	\$ 823,515	\$ 916,239	18.28
Westerly	Springbrook Elementary School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 141,050	\$ 810,495	\$ 655,340	74.58
Westerly	Westerly Middle School	\$ 22,500	\$ -	\$ 60,000	\$ 524,227	\$ 3,053,190	\$ 3,969,819	92.80
Woonsocket	Harris School	\$ 30,000	\$ 11,750	\$ 60,000	\$ 174,265	\$ 1,015,560	\$ 843,032	95.80
Woonsocket	Governor Aram J. Pothier School	\$ 30,000	\$ 11,750	\$ 60,000	\$ 212,356	\$ 1,220,625	\$ 975,120	99.78
Woonsocket	Citizens Memorial School	\$ 15,000	\$ 35,250	\$ 60,000	\$ 160,510	\$ 921,165	\$ 477,578	116.35
Woonsocket	Bernon Heights School	\$ 15,000	\$ 35,250	\$ 60,000	\$ 156,251	\$ 898,380	\$ 597,957	96.01
Woonsocket	Globe Park School	\$ 15,000	\$ 47,000	\$ 60,000	\$ 161,147	\$ 927,675	\$ 690,035	93.61
Woonsocket	Kevin K. Coleman Elementary School	\$ 15,000	\$ 11,750	\$ 60,000	\$ 115,815	\$ 667,275	\$ 279,472	157.29
Woonsocket	Leo A. Savoie School	\$ 15,000	\$ 23,500	\$ 60,000	\$ 143,325	\$ 823,515	\$ 369,328	156.63
Woonsocket	Woonsocket High School	\$ 45,000	\$ 11,750	\$ 60,000	\$ 801,014	\$ 4,605,825	\$ 4,195,805	88.43
Woonsocket	Woonsocket Middle School - Hamlet/Nova	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	138.00
Woonsocket	Woonsocket Area Career & Technical Center	\$ 15,000	\$ 11,750	\$ 60,000	\$ 163,275	\$ 937,440	\$ 1,962,532	206.98
Totals:		\$ 4,830,000	\$ 6,855,500	\$ 14,340,000	\$ 64,121,905	\$ 389,677,907	\$ 246,916,430	

We must thank the [LEAs](#), [Superintendents](#), [Facility Directors](#), [Principals](#), and all the staff for their assistance throughout the process. The information each LEA and its staff provided was extremely valuable in conducting the Study. Without access to the buildings, the cooperation of all involved this study would not have been possible.

SCHOOL BUILDING AUTHORITY

Dr. Joseph da Silva, Ph.D., AIA, School Construction Coordinator, Architectural Design Reviewer

Manuel Cordero, AIA, REFP, LEED AP, Assistant School Construction Coordinator

Mario Carreno, School Construction Finance Specialist

PROJECT TEAM

Jacobs Engineering Group, Inc.

Cooperative Strategies

