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# Energy Savings Plan

*As part of an Energy Savings Improvement Program (ESIP)*

Presented to:

***Delran Township School District***

*Delran, NJ*

Prepared by:



Revision: 3.7.16

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# 1.0 Executive Summary

Schneider Electric has completed the Investment Grade Audit process for Delran Township School District’s Energy Savings Improvement Program (ESIP). We would like to thank Christopher Russo, Michael DiGiovanni, Doug Cutts, Bryan Brotschul, Joel Deanley, Erica DiMichele, Nancy Zimmerman, and the members of the Board of Education for providing their time, assistance, and input.

The purpose of this Energy Savings Plan is to provide an overview of the District’s ESIP project. Our proposed ESIP will allow Delran Township School District (DTSD) to do the following:

- Improve the learning environment through updated lighting and building automation systems
- Better control and improve occupant comfort
- Reduce energy, operational, and water costs by almost \$300,000 annually
- Minimize risk and exposure to volatile energy prices
- Promote sustainability by transitioning to renewable energy through a solar power purchase agreement

The following measures are currently included in this ESIP program:

Energy Conservation Measure (ECM)	Delran High School	Delran Middle School	Delran Intermediate School	Millbridge Elementary School
Hot Water Pump Variable Frequency Drives & Control Valve Upgrades				
BAS Upgrade				
Retro-commissioning - D Wing				
Lighting Upgrade - Interior				
Lighting Upgrade - Exterior				
Urinal Replacement - Faculty Lounge & Boys Locker Room				
Building Envelope				
Walk-In Cooler & Freezer Controls				
Vending Miser				
Plug Load Controllers				
Solar PPA				
Water Conservation				

In order for the District to move forward with the implementation phase of the ESIP, the following steps are required:

1. Schneider to produce full Energy Savings Plan Report
2. Review and approval of this Energy Savings Plan by the District’s hired 3<sup>rd</sup> party firm
3. BPU review and approval of this Energy Savings Plan
4. DTSD to issue an RFP for lease purchase financing for the ESIP
5. DTSD to execute ESIP Construction Contract, Performance Assurance Support Services (PASS) agreement, and financing contract to authorize the Implementation of the project

We look forward to continuing to work together to deliver this cost-neutral program for the benefit of Delran Township School District.

## 2.0 Financial Analysis

### Scope Summary

The intent of this project is to maximize savings opportunities, fund critical capital improvements, and achieve the strategic goals of the District. We believe that the following energy conservation measures are the best solution to maximizing savings and meeting the District's needs within a self-funding ESIP.

Energy Conservation Measures (ECMs)		Hard Costs	Annual Savings	Payback Period
HS-1	HWP VFDs & Control Valve Upgrade	\$ 290,615	\$ 7,837	37.1
HS-3	BAS Upgrade	\$ 612,736	\$ 27,996	21.9
HS-4	Lighting Upgrade-Exterior	\$ 30,893	\$ 3,591	8.6
HS-5	Lighting Upgrade-Interior & Controls (HS-5 & 6)	\$ 116,294	\$ 16,759	6.9
HS-10	Walk-In Cooler/Freezer Controls	\$ 11,733	\$ 1,233	9.5
HS-11	Vending Miser	\$ 2,953	\$ 2,932	1.0
HS-12	Plug Load Controllers	\$ 6,891	\$ 1,167	5.9
HS-15	Solar PPA	\$ 1	\$ 49,714	0.0
HS-18	Water Conservation	\$ 42,699	\$ 6,020	7.1
MS-3	HWP VFDs & Control Valve Upgrade	\$ 386,967	\$ 3,749	103.2
MS-5	RCx D Wing	\$ 79,243	\$ 2,841	27.9
MS-6	BAS Upgrade	\$ 433,590	\$ 8,092	53.6
MS-7	Lighting Upgrade-Exterior	\$ 12,364	\$ 768	16.1
MS-8	Lighting Upgrade-Interior	\$ 125,003	\$ 10,560	11.8
MS-10	Urinal Replacement-Faculty Lounge & Boys Locker Rm	\$ 78,770	\$ -	
MS-11	Building Envelope	\$ 57,675	\$ 4,112	14.0
MS-14	Walk-In Cooler/Freezer Controls	\$ 9,122	\$ 822	11.1
MS-15	Vending Miser	\$ 1,969	\$ 1,843	1.1
MS-18	Solar PPA	\$ 1	\$ 27,463	0.0
MS-20	Plug Load Controllers	\$ 5,660	\$ 1,125	5.0
MS-21	Water Conservation	\$ 28,910	\$ 3,495	8.3
ES-1.1	ES HWP VFDs & Control Valve Upgrade	\$ 144,234	\$ 2,660	54.2
ES-1.2	ES BAS Upgrade	\$ 259,638	\$ 4,608	56.3
ES-3	Lighting Upgrade-Exterior	\$ 43,548	\$ 2,898	15.0
ES-4	Lighting Upgrade-Interior & Controls (ES-4 & 5)	\$ 156,131	\$ 10,171	15.4
ES-8	Walk-In Cooler/Freezer Controls	\$ 8,776	\$ 842	10.4
ES-9	Vending Miser	\$ 984	\$ 756	1.3
ES-12	Solar PPA	\$ 1	\$ 15,750	0.0
ES-13	Plug Load Controllers	\$ 5,906	\$ 831	7.1
ES-15	Water Conservation	\$ 28,545	\$ 6,144	4.6
IS-1	Control Valve Upgrade	\$ 357,107	\$ -	
IS-2	BAS Upgrade	\$ 55,934	\$ 16,170	3.5
IS-3	Lighting Upgrade-Interior	\$ 165,963	\$ 20,306	8.2
IS-4	Lighting Upgrade-Exterior	\$ 39,583	\$ 1,748	22.6
IS-6	Building Envelope	\$ 29,363	\$ 2,493	11.8
IS-7	Walk-In Cooler/Freezer Controls	\$ 12,900	\$ 1,309	9.9
IS-10	Solar PPA	\$ 1	\$ 19,505	0.0
IS-12	Plug Load Controllers	\$ 5,660	\$ 882	6.4
IS-13	Vending Miser	\$ 1,477	\$ 1,722	0.9
IS-15	Water Conservation	\$ 25,024	\$ 5,916	4.2
<b>Total:</b>		<b>\$ 3,674,865</b>	<b>\$ 296,830</b>	<b>12.4</b>

## Financial Summary

This project will pay for itself from the energy and operational savings realized over a 15 year term.

Category	Cost	Percentage of Hard Costs
<b>Hard Costs</b>	<b>\$ 3,674,865</b>	
Project Service Fees		
Investment Grade Energy Audit	\$ 73,497	2.00%
Design Engineering Fees	\$ 156,182	4.25%
Construction Management & Project Administration	\$ 174,556	4.75%
System Commissioning	\$ 73,497	2.00%
Equipment Initial Training Fees	\$ 18,374	0.50%
ESCO Overhead	\$ 330,738	9.00%
ESCO Profit	\$ 257,241	7.00%
<b>Total Project Cost</b>	<b>\$ 4,758,950</b>	<b>29.50%</b>

There are several remaining variables that may alter the scope of this project, including:

- Input from the District
- Final Solar PPA sizing, pricing, and savings
- Financing term and interest rate
- Incentives and rebates

## Scope Evaluated But Not Included

The following ECMs were identified as District priorities, but are currently not included in the final project. NJ ESIP law requires all costs must be covered by savings, and these items simply did not fit within the cash flow requirements. Some of these ECMs may be switched with those currently included in the project. Also, if the variables noted above come in more favorable than anticipated, there may be room for some of these ECMs to be added to the project.

Optional ECMs		Hard Costs	Annual Savings	Payback Period
HS-2.1	Gym H&V Unit Replacement-Add Cooling	\$ 763,372	\$ (9,501)	-77.7
HS-7	Building Envelope	\$ 104,221	\$ 5,281	19.1
HS-9	Security Window Film	\$ 19,164	\$ -	
MS-1	DHW Upgrade	\$ 65,451	\$ 290	218.2
MS-2	High Eff Condensing Boiler	\$ 174,760	\$ (589)	-286.8
MS-4	Music Rm AC Upgrade to RTU	\$ 185,342	\$ (52)	-3445.5
MS-13	Security Window Film	\$ 21,199	\$ -	
ES-2.1	ES Gym Replacement of H&V Units	\$ 201,556	\$ 993	196.2
ES-2.2	ES Gym Replacement of EFs	\$ 65,174	\$ -	
ES-6	Building Envelope	\$ 43,601	\$ 2,347	18.0
IS-14	DHW Upgrade	\$ -	\$ -	
<b>Total:</b>		<b>\$ 1,643,841</b>	<b>\$ (1,231)</b>	

The following ECMs were evaluated but are not recommended for inclusion in the project for a variety of reasons. Some ECMs have very little to no savings associated with them. Other ECMs were deemed not cost effective, or weren't the highest priority for the District. Some of these measures did not have a significant energy related component, and there was not a lot of value gained by including them in the ESIP.

Evaluated but not Recommended		Hard Costs	Annual Savings	Payback Period
HS-8	Security Vestibules	\$ -	\$ -	
HS-13	Clock System	\$ 30,557	\$ -	
HS-14	Security Camera-District Wide	\$ 181,651	\$ -	
HS-16	PC Power Management-Computer Replacements	\$ -	\$ -	
MS-9	Lighting Controls	\$ 87,887	\$ 446	190.5
MS-12	Security Vestibules	\$ -	\$ -	
MS-16	Bulbless Projectors	\$ -	\$ -	
MS-17	Clock System	\$ 23,871	\$ -	
MS-19	PC Power Management-Computer Replacements	\$ -	\$ -	
ES-7	Roofing Replacement-Section 300 & 400	\$ 265,843	\$ -	
ES-10	Bulbless Projectors	\$ -	\$ -	
ES-11	Clock System	\$ 19,663	\$ -	
IS-5	Lighting Controls	\$ 4,086	\$ 31	127.4
IS-8	Bulbless Projectors	\$ -	\$ -	
IS-9	Clock System	\$ 19,506	\$ -	
IS-11	PC Power Management-Computer Replacements	\$ -	\$ -	
<b>Total:</b>		<b>\$ 633,063</b>	<b>\$ 477</b>	

## Cash Flow Analysis

Project Cost: \$ 4,758,950		Revision: 3/7/2016								
Estimated Interest Rate: 2.50%										
Escalation Rates:										
Electric	2.20%									
Natural Gas	2.40%									
Water	2.20%									
O&M	0%									
Year	Electric Savings	Natural Gas Savings	Water Savings	O&M Savings	Rebates & Incentives	Total Savings	Financing Payment	M&V Costs	Net Cash-Flow to Client	Cumulative Cash Flow
Installation	\$ 76,513	\$ 6,343	\$ 6,193	\$ 14,146	\$ 20,364	\$ 123,560	\$ 121,560		\$ 2,000	\$ 2,000
1	\$ 255,042	\$ 21,145	\$ 20,643	\$ 47,154	\$ 147,816	\$ 491,800	\$ 489,800	\$ -	\$ 2,000	\$ 4,000
2	\$ 260,653	\$ 21,652	\$ 21,097	\$ 47,154	\$ 147,816	\$ 498,373	\$ 496,373	\$ -	\$ 2,000	\$ 6,000
3	\$ 266,387	\$ 22,172	\$ 21,562	\$ 47,154	\$ 4,779	\$ 362,054	\$ 360,054	\$ -	\$ 2,000	\$ 8,000
4	\$ 272,248	\$ 22,704	\$ 22,036	\$ 47,154	\$ 4,779	\$ 368,921	\$ 366,921	\$ -	\$ 2,000	\$ 10,000
5	\$ 278,237	\$ 23,249	\$ 22,521	\$ 47,154		\$ 371,161	\$ 369,161	\$ -	\$ 2,000	\$ 12,000
6	\$ 284,358	\$ 23,807	\$ 23,016	\$ 9,719		\$ 340,901	\$ 338,901	\$ -	\$ 2,000	\$ 14,000
7	\$ 290,614	\$ 24,378	\$ 23,523			\$ 338,515	\$ 336,515	\$ -	\$ 2,000	\$ 16,000
8	\$ 297,008	\$ 24,963	\$ 24,040			\$ 346,011	\$ 344,011	\$ -	\$ 2,000	\$ 18,000
9	\$ 303,542	\$ 25,562	\$ 24,569			\$ 353,673	\$ 351,673	\$ -	\$ 2,000	\$ 20,000
10	\$ 310,220	\$ 26,176	\$ 25,109			\$ 361,505	\$ 359,505	\$ -	\$ 2,000	\$ 22,000
11	\$ 317,045	\$ 26,804	\$ 25,662			\$ 369,511	\$ 367,511	\$ -	\$ 2,000	\$ 24,000
12	\$ 324,020	\$ 27,447	\$ 26,226			\$ 377,693	\$ 375,693	\$ -	\$ 2,000	\$ 26,000
13	\$ 331,148	\$ 28,106	\$ 26,803			\$ 386,058	\$ 384,058	\$ -	\$ 2,000	\$ 28,000
14	\$ 338,434	\$ 28,780	\$ 27,393			\$ 394,607	\$ 392,607	\$ -	\$ 2,000	\$ 30,000
15	\$ 345,879	\$ 29,471	\$ 27,996			\$ 403,346	\$ 401,346	\$ -	\$ 2,182	\$ 32,182
<b>Totals</b>	<b>\$ 4,551,348</b>	<b>\$ 382,757</b>	<b>\$ 368,390</b>	<b>\$ 259,637</b>	<b>\$ 325,555</b>	<b>\$ 5,887,687</b>	<b>\$ 5,855,506</b>	<b>\$ -</b>	<b>\$ 32,182</b>	

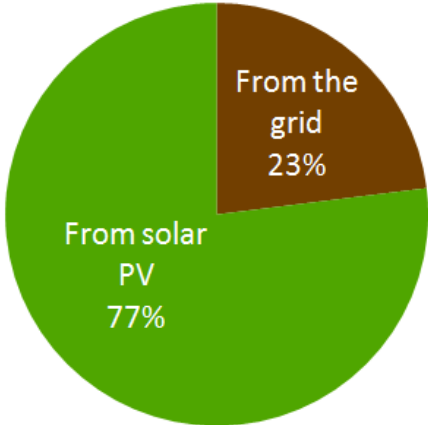
## Baseline Energy Use & Energy Savings Analysis

The following table shows DTSD’s baseline and anticipated post-project energy and water use. This is based upon the scope currently included in this report.

Utility Costs				
	Electric	Natural Gas	Water	Total
Before	\$ 630,730	\$ 162,033	\$ 60,788	\$ 853,551
After	\$ 375,688	\$ 140,888	\$ 40,145	\$ 556,721
Savings	\$ 255,042	\$ 21,145	\$ 20,643	\$ 296,830
	40%	13%	34%	35%

In addition to drastically reducing operational costs, the District will be drastically reducing its environmental footprint. 77% of the electricity used by the District will be generated by on-site renewable energy through a solar photovoltaic (PV) installation. This sends a clear message to the community that the DTSD is committed to sustainability.

### Estimated Post Project Electric Usage (kWh)





# 4.0 Next Steps

## Action Items

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The following is a list of action items that need to be taken immediately to keep the project on timeline.

1. Issue 3<sup>rd</sup> party Reviewer RFP
2. Issue solar PPA RFP (SE)
3. Produce full Energy Savings Plan Report (SE)
4. Meet to discuss financing
5. Meet to discuss M&V Options
6. Begin contract review process with attorneys

## BOE Meetings

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Committee	Full Board
3/7/16	3/14/16 - Project approval, pending solar update and necessary approvals. Issue RFP for financing
4/4/16 - Award 3rd party, PPA company, and lender	4/11/16
5/2/16 - Authorize signature of PPA, Construction, M&V, and financing contracts	5/9/16
6/6/16 – Backup date	6/13/16
7/5/16	7/5/16
8/1/16	8/29/16
9/6/16	9/12/16