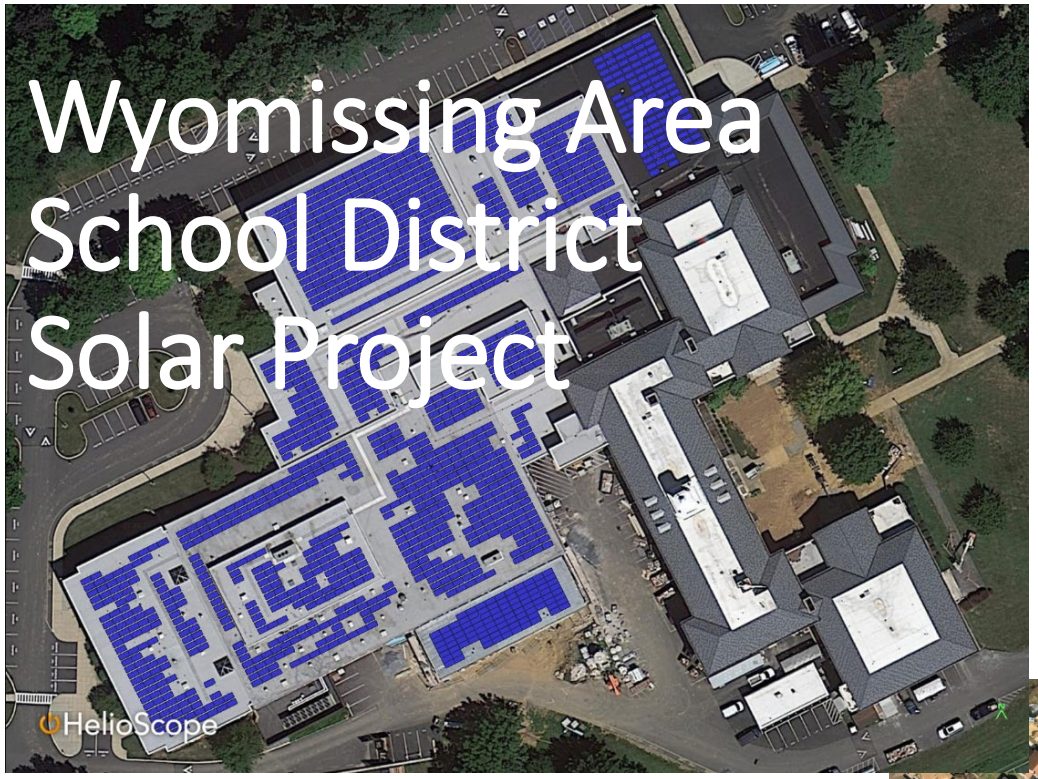
Wyomissing Area School District Solar Project



Wyomissing ASD
Committee of the Whole
4.17.23

GreenWorks Development

SRE RENEWABLES

A few things about GreenWorks Development/Solar Renewable Energy

- GWD/SRE, located in Mechanicsburg, is the largest commercial solar developer in PA, with almost $350 million in solar assets installed since 2010.
- The company tracks every federal, state, local and utility incentive that's available for solar, and specializes in incorporating those incentives into a project structure that's most advantageous for schools and other non-profits.

Floating solar array
Sayreville, NJ, Water Authority
11 acres, 4.4 MW
Second largest floating array in US

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How Does Solar Work Financially for Schools?

Problem:
As non-profit entities, schools can't take advantage of the 30% Federal Tax Credit or the 85% first-year depreciation that are available for solar.

Solution:
Special Purpose Entities are created that are comprised of investors who can take advantage of these benefits. These entities purchase, own, operate and maintain the system for an initial five-year period.

The result is that schools pay no up-front or long-term out-of-pocket investment and save significant cash immediately and over the life of the project.

The Midd-West School District in Middleburg, PA will save over $350,000/year from their array.

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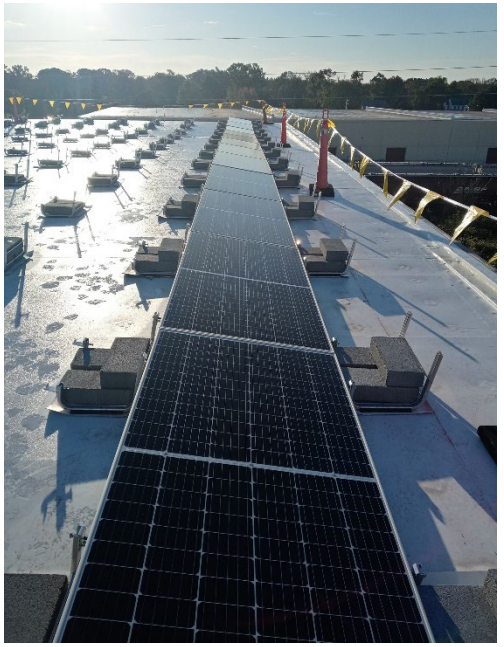
How Does Solar Work in Rooftop Applications?

Solar installed on rooftops is done using a ballasted racking system that sits on the roof with no roof membrane penetrations. A matrix of racks are set in place and are weighted down with cast concrete blocks. The panels are then mounted to the racks and wired together.

GWD/SRE will work with the building's roofing contractor to ensure the existing roof warranty is not affected by the solar installation.

Rack ballasted solar arrays are rated for 120 mph winds.

Racks in place on roof with concrete blocks in place.



Panels installed on racks.

What are SRECs?

When a district produces solar generated electricity, it will save on direct electricity cost but it will also generate Solar Renewable Energy Certificates (SRECs). These certificates can be sold to PA utilities to help them meet their annual renewables quotas.

Two sources of income for solar schools – direct electricity savings and SREC income.

Direct electricity savings – currently $0.095/kWh at WASD

PA Solar Renewable Energy Certificates (SRECs) – currently $0.045/kWh

In the Alternative Energy Portfolio Standard (AEPS) Act of 2004, Pennsylvania requires its utilities to either generate electricity using solar themselves or purchase credits from schools or other entities that generate using solar.

Recent K-12 School Project Summaries

The next several slides show summaries of several K-12 school projects done over the last several years by GWD/SRE. The summaries all show electricity rates at $0.105/kWh. These estimates are conservative – the commercial default electricity rate in these districts is already at $0.1475/kWh.

Central Columbia School District array, a combined roof mount and ground mount system. When complete in March ‘23 will be the second largest K-12 array in PA.

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Tamaqua Area School District Solar Project

Abandoned coal strip mine converted to a ground-mount solar array.

2.5 MW (7-acre) ground-mount solar array in Tamaqua, PA.

Supplies 100% of district's electricity.

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At $0.105/kWh electricity cost:

Annual savings years 1-5:	**Over $230,000**
Annual savings after buyout year 6:	**Over $350,000**
Total estimated 40-year savings:	**Almost $15 million**
Average 40-year cost of solar-generated electricity:	**$0.038/kWh**

Pottsville Area SD Solar Project

1.4 MW (170,000 total square foot) roof array in Pottsville, PA.

Supplies 48% of district's electricity.

Academic Center and Middle School

Clarke Elementary

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At $0.105/kWh electricity cost:

Savings years 1-5:	**$70,000/year**
Savings after buyout year 6:	**Over $250,000/year**
Total estimated 40-year savings:	**Over $10 million**
Average 40-year cost of solar-generated electricity:	**$0.066/kWh**

Midd-West School District Solar Project

2.54 MW (7-acre) ground-mount solar array in Middleburg, PA

Supplies 96% of district's electricity.

At $0.105/kWh electricity cost:

Savings years 1-5:	**Over $170,000/year**
Savings after buyout year 6:	**Over $350,000/year**
Total estimated 40-year savings:	**Over $15 million**

Average 40-year cost of solar-generated electricity: $0.039/kWh

Central Columbia School District Solar Project

3.8 MW (10 acre) array.

Supplies 90% of district's electricity needs.

Target completion March, '23.

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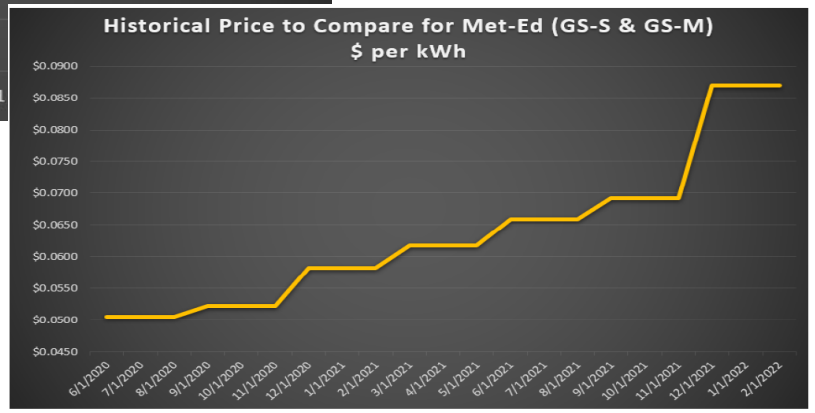
At $0.105/kWh electricity cost:

Savings years 1-5:	**Over $350,000/year**
Savings after buyout year 6:	**Over $500,000/year**
Total estimated savings over 40 years:	**Over $20 million**
40-year average cost of solar-generated electricity:	**$0.024/kWh**

PPL's Price to Compare has increased 142% in the last 30 months.



- Met-Ed Price to Compare has increased 72% in the last 21 months.

Rapidly rising electricity costs are the primary reason for schools to go solar. Installing a solar array will significantly lower the school's current electricity cost and protect it from future electricity cost increases.

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Wyomissing Area School District Solar Analysis

The remaining slides show the solar analysis done for WASD. Over the last several months the district provided electric bill and electricity supply contract information to GWD/SRE and also provided guidance on where solar could be located, including both roof and ground sites. From that information, solar layouts were done and a 40-year preliminary cash flow analysis was generated. Those layouts and cash flow analysis are shown next.

The goal of any solar analysis is to get as close as possible to 100% offset for the district to maximize solar savings.

The layout locations shown next are preliminary recommendations and can be modified by the district prior to the generation of a final analysis.

The 40-year cash flow analysis shown on the last slide has been provided to the district in Excel format. The only variables on the worksheet – electricity price increases, SREC values and system purchase interest rate – can be varied on the worksheet to see the possible effect on the overall cash flow of the system.

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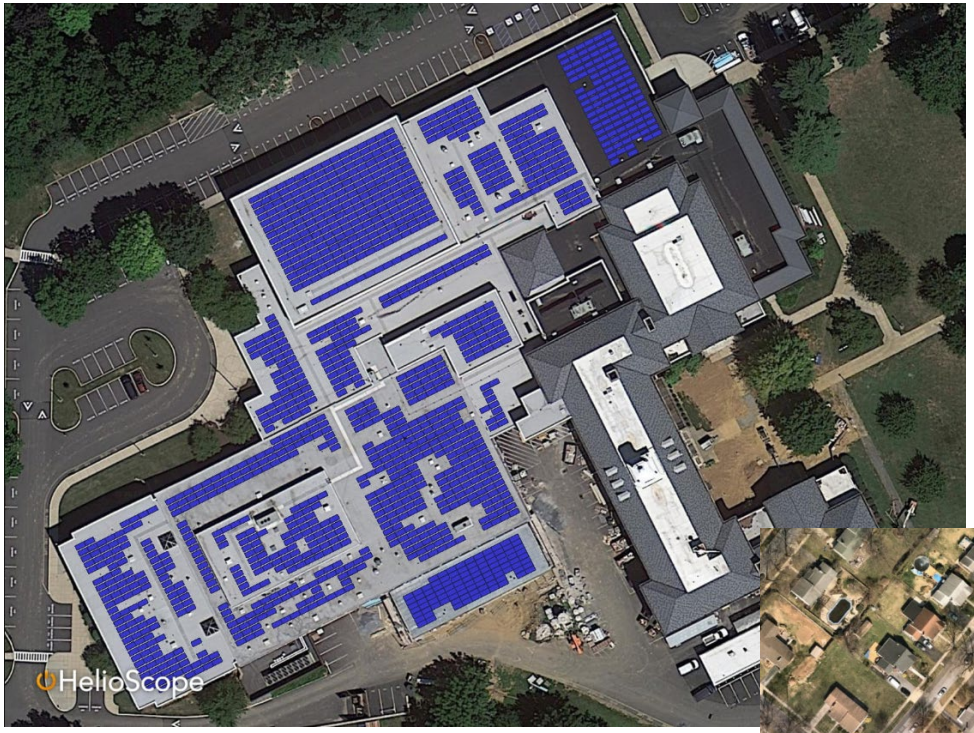

Wyomissing Area School District

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Wyomissing Junior/Senior High School

750 kW Roof Array

Wyomissing Hills Elementary

579 kW Roof Array

273 kW Ground Array

Ground Mount Array Aesthetics: Pollinator-Friendly Array

A wildflower perimeter around a solar array can be combined with a decorative fence to significantly increase the aesthetics of the installation.

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Wyomissing Area School District
Solar Project

Offsets 66% of WASD's electricity use

Includes a $500,000 roof replacement allowance

At $0.095/kWh electricity cost:

Net cash flow years 1-5: ~ $60,000/year

Net cash flow years 6-40: Over $137,000/year

Cumulative net 40 year cash flow: Almost $6 million

*** No up-front cash investment**

*** System purchase in year 6 can be 100% financed – no cash required**

*** 40-year average cost of solar-generated electricity: $0.058/kWh**

WYOMISSING AREA School District

-Includes a $500,000 roof replacement allowance

28-year PSA (Power Service Agreement)
Debt Financing beginning in year 6
30-year term, 4% interest rate

40 year Cash Flow Schedule (Debt Financing of Year 6 Buyout Option)

1) Buyout in year 6 - funding via long-term, low-interest debt financing (equity/non-debt buyout is available as well).
2) 40-year cash flow is based on the estimated useful life of a solar array.
3) Electricity "hedge" against inflation for the next 40 years (since you are independently producing your own energy).
4) Average generation cost of electricity over the next 40 years - $0.058/kWh (see M).

	1	2	3				4	5		6			
	A	B	C	D = A/1000 x B	E = A x C	F = D + E	G	H	I	J	K = G + H + I + J	L = F - K	
	Solar Electricity Generated	Solar Renewable Energy Credit Unit	Avoided Cost of Electricity	SREC	Electricity	Total Cash	Contract Service	Debt Financing/Down-Payment		Operations and	Total Cash	Net Cash	Cumulative Net Cash	M = (K - D) / A Cost of Electric Rate/kWh
Year	(kWhs)	Value	(kWh)	Income	Savings	Inflows	Payment	Principal	Interest	Maintenance	Outflows	Flows	Flows	
1	2,044,728	$ 40	$ 0.095	$ 81,789	$ 193,671	$ 275,460	$ 210,000				$ 210,000	$ 65,460	$ 65,460	$ 0.063
2	2,034,555	$ 40	0.095	81,382	192,707	274,089	213,150				213,150	60,939	126,399	$ 0.065
3	2,024,433	$ 40	0.097	80,977	195,583	276,561	216,347				216,347	60,213	186,612	$ 0.067
4	2,014,361	$ 40	0.099	80,574	198,502	279,077	219,592				219,592	59,484	246,096	$ 0.069
5	2,004,340	$ 40	0.101	80,174	201,465	281,639	222,886				222,886	58,752	304,849	$ 0.071
6	1,994,368	$ 40	0.103	79,775	204,472	284,247	-	$ 41,486	$ 93,069	$ 12,500	147,055	137,192	442,041	$ 0.034
7	1,984,445	$ 40	0.105	79,378	207,524	286,902	-	$ 43,145	$ 91,410	12,875	147,430	139,472	581,512	$ 0.034
8	1,974,573	$ 40	0.107	78,983	210,621	289,604	-	$ 44,871	$ 89,684	13,261	147,816	141,788	723,301	$ 0.035
9	1,964,749	$ 40	0.109	78,590	213,765	292,355	-	$ 46,666	$ 87,889	13,659	148,214	144,141	867,441	$ 0.035
10	1,954,974	$ 40	0.111	78,199	216,955	295,154	-	$ 48,532	$ 86,022	14,069	148,624	146,531	1,013,972	$ 0.036
11	1,945,248	$ 40	0.113	77,810	220,193	298,003	-	$ 50,474	$ 84,081	14,491	149,046	148,958	1,162,930	$ 0.037
12	1,935,570	$ 40	0.115	77,423	223,480	300,903	-	$ 52,493	$ 82,062	14,926	149,480	151,422	1,314,352	$ 0.037
13	1,925,940	$ 40	0.118	77,038	226,815	303,853	-	$ 54,592	$ 79,962	15,373	149,928	153,925	1,468,277	$ 0.038
14	1,916,358	$ 40	0.120	76,654	230,201	306,855	-	$ 56,776	$ 77,779	15,835	150,389	156,466	1,624,742	$ 0.038
15	1,906,824	$ 40	0.123	76,273	233,637	309,910	-	$ 59,047	$ 75,508	16,310	150,864	159,045	1,783,788	$ 0.039
16	1,897,338	$ 25	0.125	47,433	237,124	284,557	-	$ 61,409	$ 73,146	16,799	151,354	133,203	1,916,991	$ 0.055
17	1,887,898	$ 25	0.127	47,197	240,663	287,860	-	$ 63,865	$ 70,689	17,303	151,858	136,003	2,052,993	$ 0.055
18	1,878,506	$ 25	0.130	46,963	244,255	291,217	-	$ 66,420	$ 68,135	17,822	152,377	138,841	2,191,834	$ 0.056
19	1,869,160	$ 25	0.133	46,729	247,900	294,629	-	$ 69,077	$ 65,478	18,357	152,911	141,718	2,333,552	$ 0.057
20	1,859,860	$ 25	0.135	46,497	251,600	298,097	-	$ 71,840	$ 62,715	18,907	153,462	144,635	2,478,187	$ 0.058
21	1,850,607	$ 25	0.138	46,265	255,356	301,621	-	$ 74,714	$ 59,841	307,763	442,317	(140,697)	2,337,490	$ 0.214
22	1,841,400	$ 25	0.141	46,035	259,167	305,202	-	$ 77,702	$ 56,853	20,059	154,614	150,588	2,488,079	$ 0.059
23	1,832,239	$ 25	0.144	45,806	263,035	308,841	-	$ 80,810	$ 53,745	20,661	155,215	153,626	2,641,704	$ 0.060
24	1,823,124	$ 25	0.146	45,578	266,961	312,539	-	$ 84,043	$ 50,512	21,280	155,835	156,704	2,798,408	$ 0.060
25	1,814,053	$ 25	0.149	45,351	270,946	316,297	-	$ 87,404	$ 47,151	21,919	156,474	159,823	2,958,232	$ 0.061
26	1,805,028	$ 7	0.152	12,635	274,989	287,625	-	$ 90,900	$ 43,654	22,576	157,131	130,493	3,088,725	$ 0.080
27	1,796,048	$ 7	0.155	12,572	279,094	291,666	-	$ 94,536	$ 40,018	23,254	157,808	133,858	3,222,583	$ 0.081
28	1,787,112	$ 7	0.159	12,510	283,259	295,769	-	$ 98,318	$ 36,237	23,951	158,506	137,263	3,359,846	$ 0.082
29	1,778,221	$ 7	0.162	12,448	287,487	299,935	-	$ 102,251	$ 32,304	24,670	159,225	140,710	3,500,556	$ 0.083
30	1,769,374	$ 7	0.165	12,386	291,778	304,164	-	$ 106,341	$ 28,214	25,410	159,965	144,199	3,644,755	$ 0.083
31	1,760,572	$ 7	0.168	12,324	296,133	308,457	-	$ 110,594	$ 23,961	26,172	160,727	147,730	3,792,484	$ 0.084
32	1,751,813	$ 7	0.172	12,263	300,553	312,815	-	$ 115,018	$ 19,537	26,957	161,512	151,303	3,943,788	$ 0.085
33	1,743,097	$ 7	0.175	12,202	305,039	317,240	-	$ 119,619	$ 14,936	27,766	162,321	154,919	4,098,707	$ 0.086
34	1,734,425	$ 7	0.178	12,141	309,591	321,732	-	$ 124,403	$ 10,151	28,599	163,154	158,579	4,257,286	$ 0.087
35	1,725,796	$ 7	0.182	12,081	314,212	326,293	-	$ 129,380	$ 5,175	29,457	164,012	162,281	4,419,566	$ 0.088
36	1,717,210	$ 7	0.186	12,020	318,902	330,922	-	$ -	$ -	30,341	30,341	300,582	4,720,148	$ 0.011
37	1,708,667	$ 7	0.189	11,961	323,662	335,622	-	$ -	$ -	31,251	31,251	304,371	5,024,519	$ 0.011
38	1,700,166	$ 7	0.193	11,901	328,492	340,394	-	$ -	$ -	32,189	32,189	308,205	5,332,725	$ 0.012
39	1,691,707	$ 7	0.197	11,842	333,395	345,237	-	$ -	$ -	33,154	33,154	312,083	5,644,808	$ 0.013
40	1,683,291	$ 7	0.201	11,783	338,371	350,154	-	$ -	$ -	34,149	34,149	316,006	5,960,813	$ 0.013
	74,332,179			$ 1,831,941	$ 10,291,556	$ 12,123,497	$ 1,081,976	$ 2,326,726	$ 1,709,918	$ 1,044,064	$ 6,162,684	$ 5,960,813		$ 0.058 40-y

Savings

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