



Oldmans Township School

Salem County, NJ

Renewable Energy System Design Presentation

Oldmans Township, NJ

Capturing Benefits of Solar + Wind

spiegle
group

ARCHITECTURE
PLANNING
DESIGN

UPDATED November 10, 2010 | OLDMANS TOWNSHIP BOARD OF EDUCATION

Project Considerations

Size PV & Wind to building energy use

- Last 12 months energy use = 657,900 kW hr
- Current electrical cost = \$0.15 kW hr



Goal: Cash-Positive Return

- Structured so savings & revenue exceed cost
- Target funds from NJDOE; SREC's; and Financing Structure
- Evaluated Direct Install (Referendum) & PPA Options

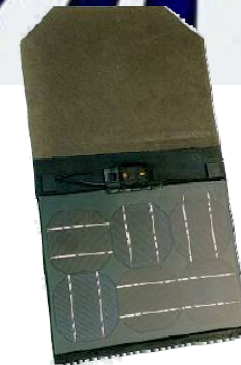
Target March 2011 Referendum

- Awaiting DOE Funding, Approval

About Solar Systems

Panel Types

- Crystalline (Silicon), 15-18% efficient
- Thin-Film, 6-9% efficient, flexible
- Ground or Roof mount installations



Why Solar?

- Economic: reduces energy purchase cost
- Economic: generates revenue (SREC's)
- Environmental: reduces fossil fuel use
- Social: educational tool for students

About Solar Systems

What are SREC's?

- Solar Renewable Energy Credit (SREC) = 1 per 1,000 kW hr
- Wind Renewable Energy Credits structured similarly
- Utilities required to achieve 22.5% renewables by 2021 (2% Solar)

Revenue and Cost Savings

- Energy Saved: 1 kW hr generated = 1 kW hr not purchased

– SREC's

	2010	2011	2012	2013	2014	2015	2016
BPU set ACP*	693	675	658	641	625	609	594
Est. SREC value**	658	641	625	609	594	579	564

**Alternative Compliance Payment ("penalty") for utilities*

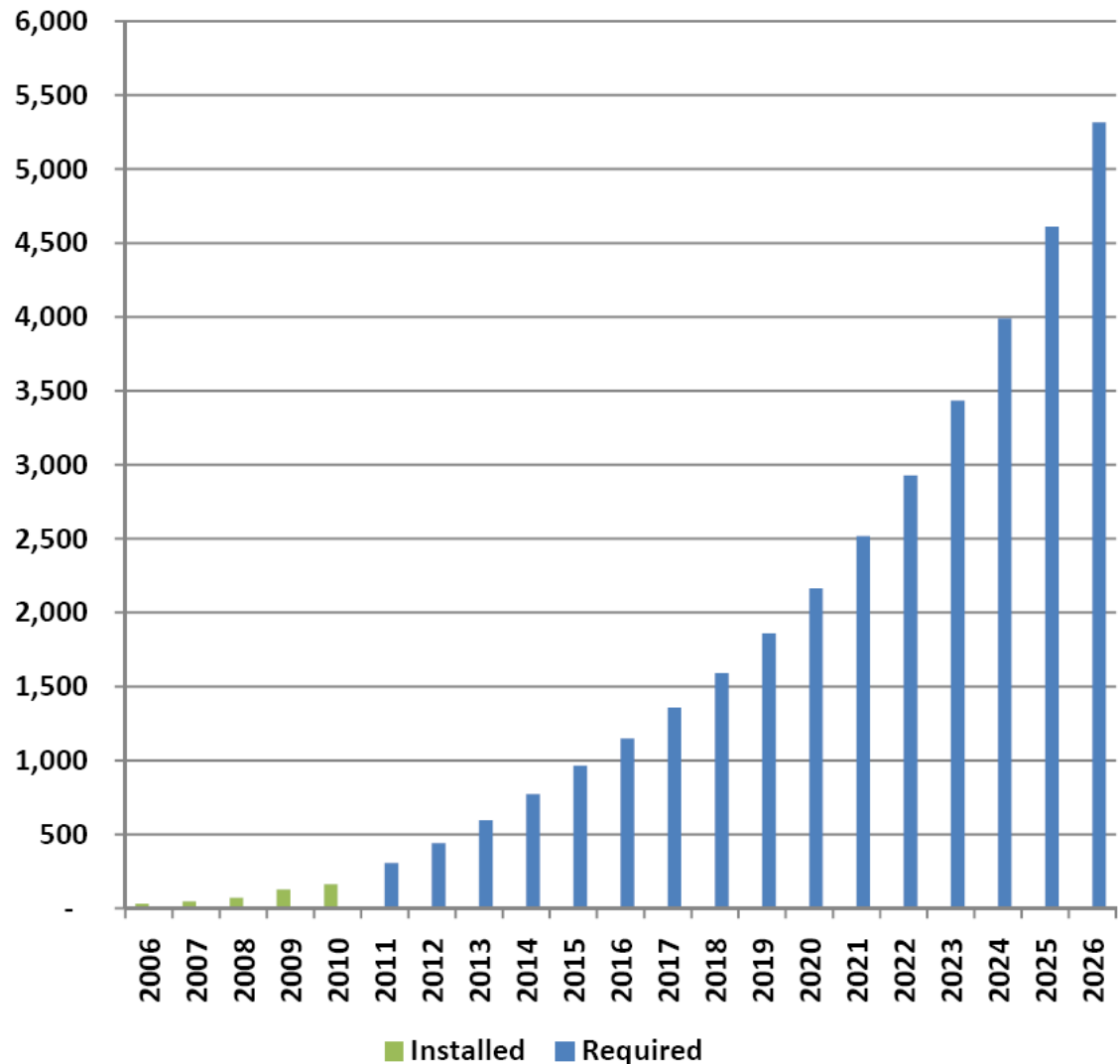
***projected average based on approx. 95% of BPU fixed SACP*

- NJDOE funding for school districts (debt service)

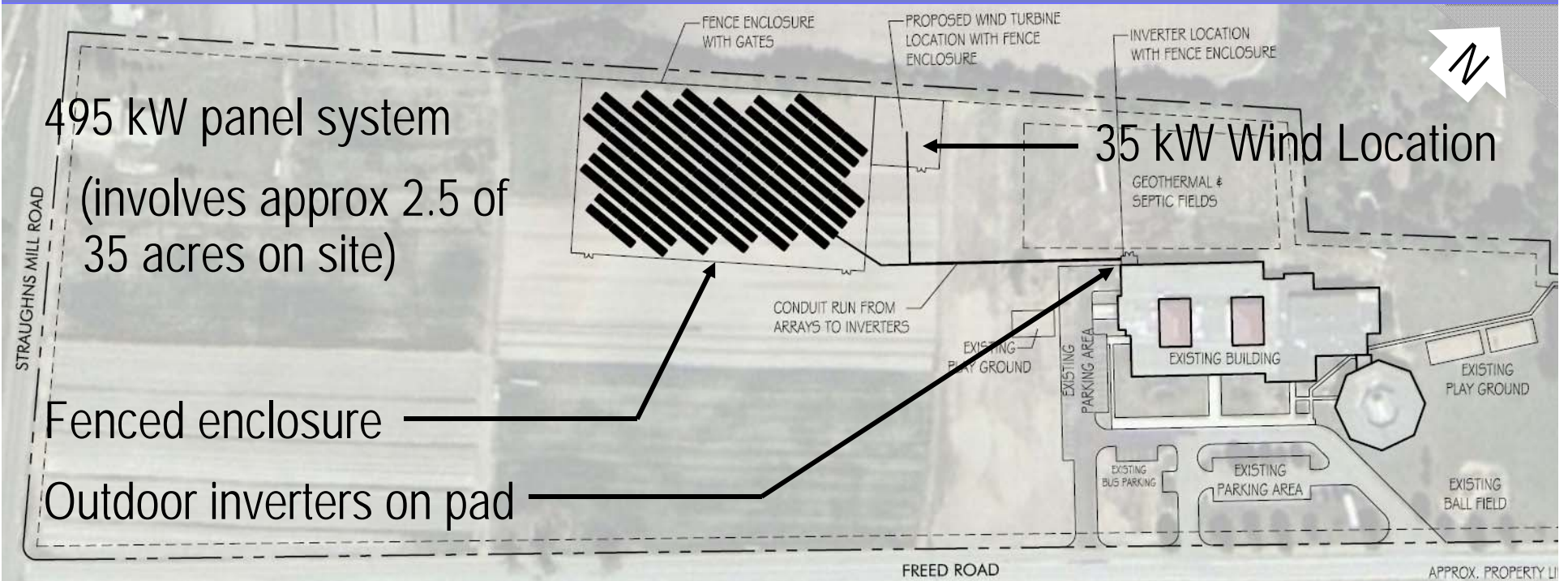
Solar Systems & SREC's

Solar needed to meet State goals

- 2.5 GW by 2021
- 5.3 GW by 2026
- Penalties apply to every kW not met



Solar Layout (Ground)



Financial Assumptions

Costs:	Costs estimated as overall costs including panels, structure, soft costs, conting., etc.
PV Panel Efficiency:	Warranty 25 years at 80% min. output
Degradation (solar/wind):	0.50 – 1.0% annually
Energy Costs:	\$0. 15 is used as base rate moving forward (average \$0.17 for last 12 months)
Energy Cost Escalation:	2% annually (3-5% often typical)
S/W REC Values:	\$300-475 / SREC average (years 1-15)
Financing:	4.5%, 15 year bonds (currently < 4.0%)
NJDOE Funding:	District Aid % (40%) excluding structure; assuming wind qualifies (being confirmed)

Cash Positive Return

Estimated Costs

Project Costs (Referendum)

Est. Hard Costs	\$	2,958,800
Est. Soft Costs <i>(contingency, A/E, legal, bonding, approvals, etc.)</i>	\$	600,880
Estimated Project Costs	\$	3,559,680

Cash Positive PV + Wind System

Annual Savings (Avg)	\$	148,210
Yrs 1-15 Total	\$	2,223,000
Yrs 16-30 Total	\$	1,990,000
	\$	4,213,000

Funding

Payments (Annualized)

Est. Annual Bond P & I <i>(15 years, 4.5%)</i>	\$	331,000
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Savings (Annualized)

NJDOE Debt Service Aid <i>(assume 40% wind + solar; excluding structure)</i>	\$	(107,207)
Est. SREC Revenue <i>(Years 1-15: SREC avg \$475, WREC \$300)</i>	\$	(265,740)
Est. Energy Savings <i>(\$0.15/kW hr base; +2%/year)</i>	\$	(106,262)
Savings Subtotal	\$	(479,210)
Est. Annual Revenue (Yr 1-15)	\$	148,210

Target March Referendum

March 8th, 2011 (2nd Tuesday)

Upcoming/Recent Activities

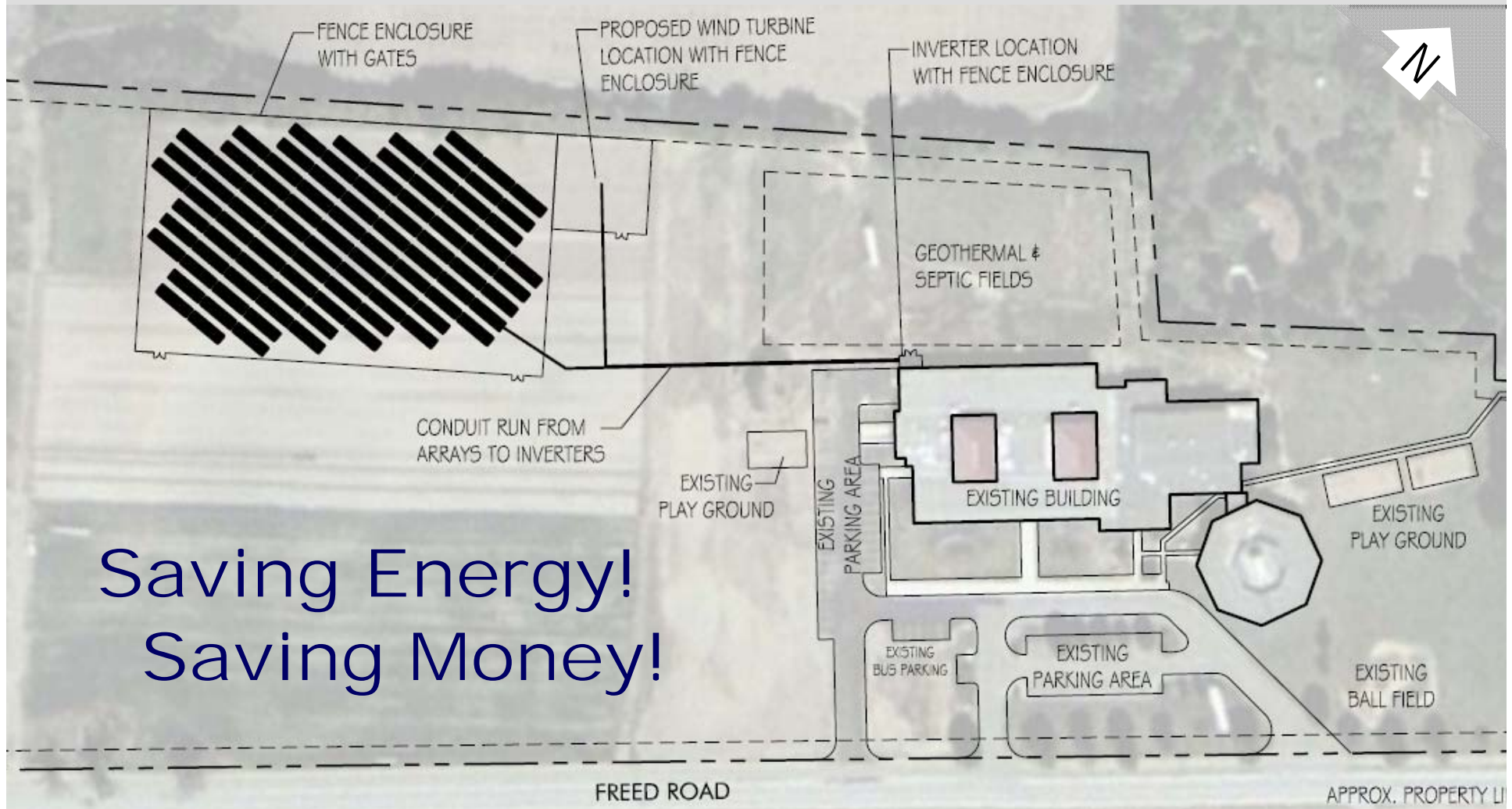
- NJ DOE Submissions awaiting approval
- Newsletter/flyer distributed prior to end of school last year
- Presentation made to Township Commission
- BOE presentations
- Pedricktown Day (October 9, 2010)
- Public presentations, newsletters, backpack materials, etc.

Bid/Construction: 2011



Oldmans Township School Solar/Wind

Salem County, NJ



Saving Energy!
Saving Money!

Spiezele Experience/Examples

Examples from Over 30 Mega-Watts underway

Dallastown Area School District	506 KW	Nestle Waters	1000 KW
Downingtown Area School District	575 KW	Panther Valley School District	628 KW
Lower Moreland Twp. School District	575 KW	St. Joseph's Medical Center	679 KW
Hopewell Township – Public Works	40 KW	Warrington Township	148 KW
Hopewell Valley Regional School District	100 KW	Uwchlan Township	57 KW
Lawrence Township Board of Education	1240 KW	West Chester Borough	68 KW
Piscataway Township Board of Education	160 KW	Point Pleasant Beach School District	40 KW
Stafford Township Board of Education	400 KW	Robbinsville Board of Education	50 KW
Brick Township Board of Education	525 KW	Elsinboro Township School District	45 KW
Glen Rock Public Schools	160 KW	Woodbridge Township Board of Education	250 KW
Ewing Township Board of Education	100 KW	Woodstown-Pilesgrove School District	200 KW
Freehold Regional High School District	700 KW	Washington Township Board of Education	700 KW
Lakehurst Board of Education	100 KW	West Windsor-Plainsboro School District	220 KW
Manchester Township Board of Education	63 KW	Point Pleasant Borough Board of Education	150 KW
Pitman Board of Education	160 KW	Oldmans Township Board of Education	495 KW
Plumsted Township Board of Education	122 KW	Reading Electric	120 KW
Pennsbury School District	20 KW	Quinton Board of Education	60 KW

Case Study (design, bid, build)

Lawrence Township BOE (1,200 kW)

- 1,200 kW on 7 school roofs
- Operational June 2009
- Completed 13% below budget



<u>Budget</u>		<u>Actual</u>
\$9,300,000	Cost	\$8,053,940
\$534,000/yr <i>(Based on \$280 per SREC)</i>	Energy Cost Savings & SREC'S	\$978,000/yr <i>(Based on \$650 per SREC)</i>

Case Study (design, bid, build)

Piscataway Township BOE (161 kW)

- 161 kW on 3 middle school roofs
- Operational July 2009
- Completed 15% below budget



Budget

\$1,460,625

\$68,000/yr

(Based on \$370 per SREC)

Cost

Energy Cost Savings
& SREC's

Actual

\$1,245,941

\$150,000/yr

(Based on \$650 per SREC)

Case Study (Power Purchase Agreement)

Hazlet Township BOE (1.3MW)

- 1.3 MW on 3 schools; combination of roof mounted, parking canopies and ground mounted systems
- Anticipated to be Operational December 2010
- SREC's paid directly to PPA



Similar image of parking canopy from William Paterson Univ.

Existing

\$.17 /kWh

Cost / kWh

Actual

\$.0975 /kWh

Energy Cost Savings

\$114,039/yr

(Based on average 1.55 MW usage per year)