Nutley Public School District

Presentation to
Nutley School Board

Opportunities for
Renewable Energy

SPIEZLE ARCHITECTURAL GROUP, INC.

Architectural / Engineering Services

Presenters

Spiezle Architectural Group, Inc.

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Mid-Atlantic Solar Energy Industries Association Member

2009 Green Leadership Award Honoree

Spiezle Architectural Group, Inc. is proud to be designated as a USGBC-NJ Green Leadership Honoree in the category of 'Corporate Commitment: Small Business'

Energy Options

Renewable Energy

- Solar
- Wind
- Solar / Thermal
- Geothermal

Traditional

- Utility provided gas/ electric

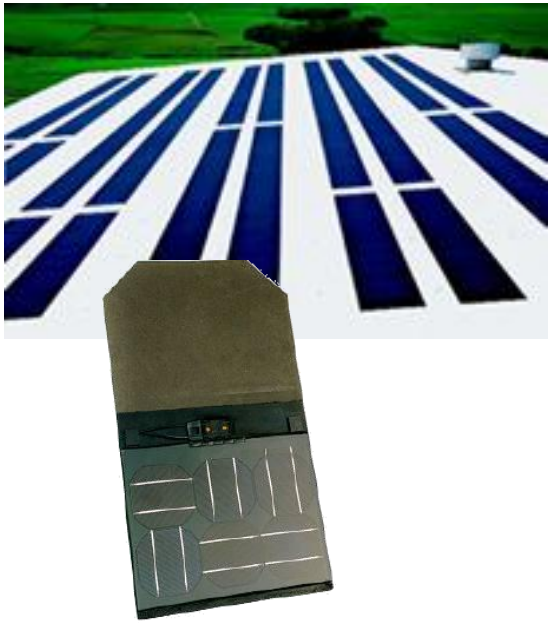
Photovoltaic Solar Systems

Panel Types

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

Why Solar?

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



Solar Considerations

Building Orientation

Roof Installations

- Trees, walls, chimneys, etc
- Mechanical equipment & vents
- Clearances & fall protection
- Age/condition of roof & structure
- Wind uplift requirements
- Fire fighting considerations

Ground Installations

- Security & maintenance
- Potential concerns from neighbors

Solar Design Considerations

PV and Racking Systems (Roof)

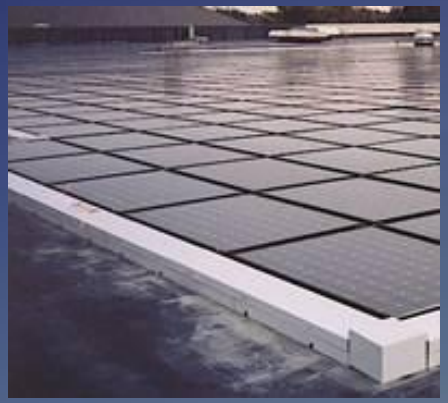
- Ballasted, 'dead-weight' systems
- Grouping for operation & wind resistance
- Eliminates roof penetrations
- Removable
- Compatible with roof warranties
- Light weight (4 - 9 lbs/sq. ft.)

Ground Installations

- 'Dead-weight' and structure supported
- Tracking systems – higher maintenance
- Fixed systems – canopy or ground

Solar Design Considerations

Mounting Options & Equipment



Flat, Ballasted

Canopy Example

Weather Station

Inverter

Flat Roof, Ballasted

Sloped, Anchored

Thin-film, Adhered

Combiner Box

Solar Benefits

Economic

Energy Savings

- Reduce energy purchase costs
- 1 kW hr created = 1 kW hr not purchased

Renewable Energy Credits (REC's)

- 1 REC ≈ 1,000 kW hr produced
- Current value = $650 per REC
- Rough Translation: 100 kW ≈ $65,000

Solar Benefits

Current SREC Trading Statistics Reporting Year 2010

For SRECs from electricity produced August 2009- August 2010.

			SREC Quantity		Monthly		Cumulative	
Month	Year	Active kW DC	Issued in Month	Traded in Month	High ($/MWh)	Low ($/MWh)	# of SRECs Traded	Weighted Avg Price ($/MWh)
Aug	2010	157,129	1,107	49,872	$693	$175	184,781	**$617.01**
Jul	2010	151,850	5,024	43,358	$691	$170	134,909	**$605.97**
Jun	2010	140,709	26,275	15,636	$690	$170	91,551	**$588.96**
May	2010	132,956	16504	8,737	$700	$170	75,915	**$578.80**
Apr	2010	123,892	12,546	6,773	$700	$170	67,178	**$573.95**
Mar	2010	119,829	5,814	9,522	$700	$209	60,405	**$568.66**
Feb	2010	113,770	6,784	9,720	$685	$170	50,883	**$552.69**
Jan	2010	103,857	5,249	11,731	$675	$110	41,163	**$533.15**
Dec	2009	100,086	7,862	7,582	$700	$195	29,432	**$566.91**
Nov	2009	97,491	6,191	7,292	$688	$170	21,850	**$559.45**
Oct	2009	93,412	8,085	7,004	$680	$170	14,558	**$549.84**
Sept	2009	92,032	8,796	5,119	$700	$170	7,554	**$524.90**
Aug	2009	89,660	10,320	2,435	$685	$170	2,435	**$492.18**

*Source: www.njcleanenergy.com

Solar Benefits

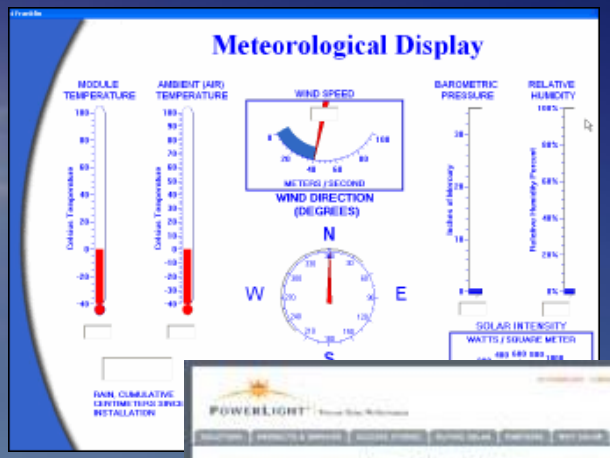
Educational & PR

Interactive Data

- Real-time to the desktop
- Lobby kiosks
- Weather: understand impact on output

Public Education/Awareness

- Awareness of district efforts to reduce costs
- Goodwill and positive public relations



Solar Benefits

Environmental

100 kW (11 homes) =

820 tons CO_2 emissions avoided

246 acres of trees planted

2,255,000 miles not driven

Lawrence Township School District

1.2 MW Photovoltaic System on 7 Schools

Hopewell Valley School District

80 KW Photovoltaic System on 2 Schools

Stafford Township School District

400 KW Photovoltaic System on 3 Schools

Stafford Township School District

400 KW Photovoltaic System on 3 Schools

Hopewell Township

40 KW Photovoltaic System Ground Mounted

Nutley Public School District

Financial Feasibility Analysis

PVWatts

AC Energy & Cost Savings

Cautions for Interpreting the Results

Nutley 870kW Photovoltaic System

Station Identification	
Cell ID:	0268370
State:	New Jersey
Latitude:	40.9 ° N
Longitude:	74.2 ° W
PV System Specifications	
DC Rating:	870.0 kW
DC to AC Derate Factor:	0.770
AC Rating:	669.9 kW
Array Type:	Fixed Tilt
Array Tilt:	10.0 °
Array Azimuth:	210.0 °
Energy Specifications	
Cost of Electricity:	13.2 ¢/kWh

Results			
Month	Solar Radiation ($kWh/m^2/day$)	AC Energy (kWh)	Energy Value ($)
1	2.22	45421	6005.56
2	3.06	57915	7657.52
3	4.48	91574	12107.92
4	5.10	98127	12974.35
5	5.92	115776	15307.90
6	6.38	117401	15522.76
7	5.90	109833	14522.12
8	5.40	101176	13377.49
9	4.75	87781	11606.40
10	3.68	72283	9557.26
11	2.41	45631	6033.33
12	2.05	41000	5421.02
Year	4.29	983918	130093.64

Nutley Public School District

Financial Feasibility Analysis

District owned Photovoltaic Solar System

870 kW Photovoltaic System (equates to approx. 983,918 kWh produced)

Estimated Construction Cost (roof mounted) = $3,654,000

Annual Financial Savings

Annual Energy Savings = **(983,918 kWh x 13.2 cents/kWh)**	**$ 129,877**
Renewable Energy Credits = **(984 SREC's x $440)**	**$ 432,960**
Total Estimated Annual Savings =	**$ 562,837**

Simple Payback – 6.5 years

Nutley Public School District

Radcliffe Elem. School

Lincoln Elem. School

Washington Elem. School

Yantacaw Elem. School

Spring Garden Elem. School

Nutley Public School District

Nutley High School

Nutley School District

Triple Bottom Line

Economic, Educational, Environmental

Renewable Energy benefits us all

Thank You

SPIEZLE ARCHITECTURAL GROUP, INC.

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