Valley View School District

November 13, 2018

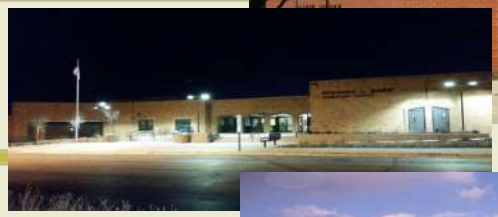
VE SCHOOL SOLAR PROJECT

Jane Addams Middle School

H.H. Humphrey Middle School

J.L. McGee Elementary School

B.J. Ward Elementary School



J.J. Lukancic Middle School

Spring and Summer 2017

VE SCHOOL SOLAR PROJECT

Spring and Summer 2017

Why Solar SITE SUMMARY

- **Compatible with Roof Replacement Projects**
  - **BJ Ward ES**
  - **JL McGee ES**
  - **Jane Addams MS**
  - **HH Humphrey MS**
  - ***Solar located on* Lukancic *in lieu of* Irene King *due to structural support capabilities***
    - ***60 mil roof membrane on JJL vs 45 mil on IHK***
    - ***Longer life expectancy on a 60 mil roof***
- **Solar panels can increase the longevity of the roof membrane by several years**

Why Solar

ANALYTICS

Photovoltaic Production Analysis

SCHOOL	ANNUAL CONSUMPTION PRE-PV INSTALLATION (KwH)	ESTIMATED ANNUAL PRODUCTION OF PV SYSTEM (KwH)	PERCENTAGE OF ELECTRICITY GENERATED BY PV
JA	1,405,640	762,276	54%
HHH	1,267,434	885,018	70%
BJW	738,233	531,611	72%
JLM	614,043	403,413	66%
JJL	1,508,925	444,358	29%
TOTAL	**5,534,275**	**3,026,676**	55%

Why Solar

FINANCIAL

	Average annual electric bill last 5 years	Projected annual savings with solar panels
Jane Addams MS	$105,488	$56,963
Humphrey MS	$104,319	$73,023
BJ Ward ES	$ 70,186	$50,533
Jamie McGee ES	$ 55,553	$36,664
Lukancic MS	$134,529	$39,013
TOTALS	$470,075	$256,196

This represents a 55% savings on our annual electric bill

Why Solar

FINANCIAL

Solar Panels Will Generate 25 Year Cash Flow…

Without SREC's: approximately $2.7 million
With 5 years of SREC's: approximately $4.2 million
With 10 years of SREC's: approximately $5.7 million
With 25 years of SREC's: approximately $10 million

Why Solar

FINANCIAL

- **Solar Panels Will Generate Net Positive Cash Flow with SREC Income**
  - Net positive cash flow year one
  - First fifteen years: more than $100k annual revenue
  - Next ten years: more than $600k annual revenue

Why Solar

FINANCIAL

ASSUME 25 YEARS OF PANEL PRODUCTIVITY:

Energy Savings Over 25 Year Period	$ 9,292,109
Renewable Credits Over 25 Year Period	$ 7,356,928
TOTAL	**$ 16,649,037**

Debt Service (Assuming Lease Option)	$ 6,627,240

NET SAVINGS TO THE DISTRICT OVER 25 YEARS: ***$ 10,021,797***

Why Solar

FINANCIAL

- All financial calculations are based on conservative estimates
  - Solar power will be used as peak demand power
  - Solar power offsets higher prices during demand
  - Panel performance calculations are de-rated by 15%
  - Our ESCO (Energy Service Company) partner guarantees the energy output of the solar PV

- Confirmation
  - All energy performance calculations were independently confirmed by Kenneth J. Kogut & Associates, Certified Energy Manager

Why Solar

ASSURANCE

- Illinois Renewable Portfolio Standard
- By 2025: 182,650 Megawatts of solar power generation is mandated in Illinois
- In 2016: Illinois currently has less than 12 Megawatts of solar power generation
- Solar Renewable Energy Credits (SRECs)
- Federal building mandate requirements:
- 10% renewable by 2016
- 25% renewable by 2025
- District can use SRECs as Private Market Commodity
- Can sell to Apple, Google, Ikea, Nike, etc.

Why Solar

RELIABILITY

- **Equipment benefits**
- System Stability – There are no moving parts
- Solar Panels – UL certified, carries a 25 year power production warranty
- Racking Support – Carries a 25 year warranty
- AC/DC Inverters – UL certified, carries a 10 year warranty (solid-state low cost parts)
- Code Compliant - Meets ASCE7-10, Category III requirements at 120 mph wind speed
- Long Term - Low cost of ownership, operations and maintenance

Why Solar

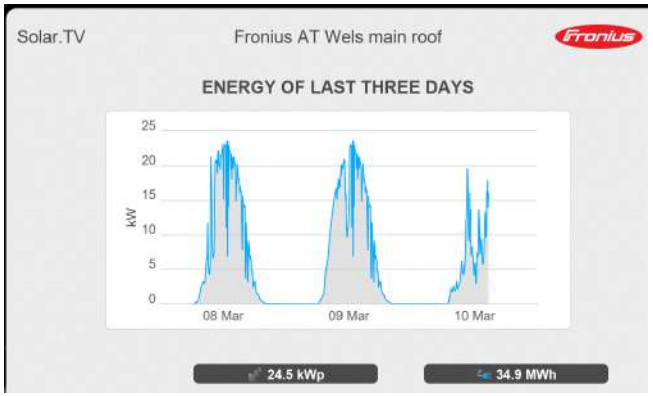
EDUCATION

- Investment in the future
  - Onsite learning tools to incorporate into curriculum
  - Compatible with S.T.E.M. Learning Units
  - Reduces CO2 in the atmosphere and models energy stewardship
- Illinois School Districts
  - ? other school districts in Illinois currently have solar installations

Why Solar

ANALYTICS

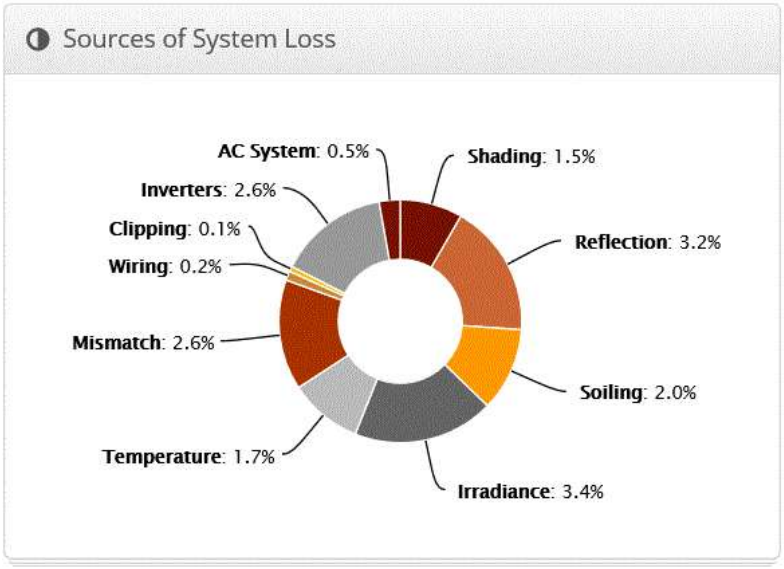
- **Location**
- Production figures are based on local weather files
- Operating sunlight: 4,696 hours per year
- Total hours of sunlight: 8,760 hours per year
- Average of sun's energy per hour since 1961
- **Monitoring**
- Short and Long term monitoring will be implemented using industry software



Why Solar

ANALYTICS

Calculated System Loss



System Metrics

System Metrics PDF CSV

Design	Roof 325W
Module DC Nameplate	397.5 kW
Inverter AC Nameplate	395.5 kW Load Ratio: 1.00
Annual Production	523.4 MWh
Performance Ratio	83.9%
kWh/kWp	1,316.8
Weather Dataset	TMY, CHICAGO, NSRDB (tmy2)
Simulator Version	153 (443094f0ad-ea93f843ef-fce6caf820-00aa14f623)

BJ Ward Elementary School

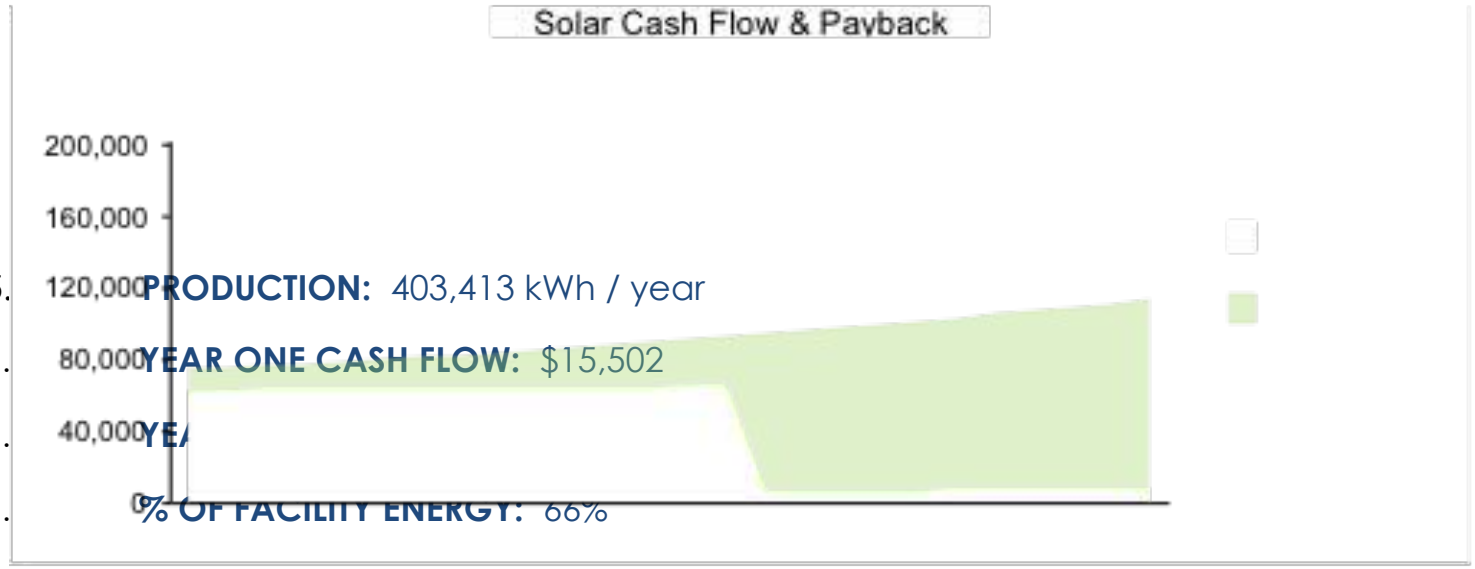
SOLAR SYSTEM INFORMATION

1. **SYSTEM SIZE:** 397.5 kW
2. **INSTALLED PRICE:** $902,499
3. **FINANCED:** 3% over 15 years
4. **ENERGY USE:** 783,233 kWh / year
5. **PRODUCTION:** 531,611 kWh / year
6. **YEAR ONE CASH FLOW:** $22,323
7. **YEA**
8. **% C**

JL McGee Elementary School

SOLAR SYSTEM INFORMATION

1. **SYSTEM SIZE:** 305.5 kW
2. **INSTALLED PRICE:** $702,029
3. **FINANCED:** 3% over 15 years
4. **ENERGY USE:** 614,043 kWh / year

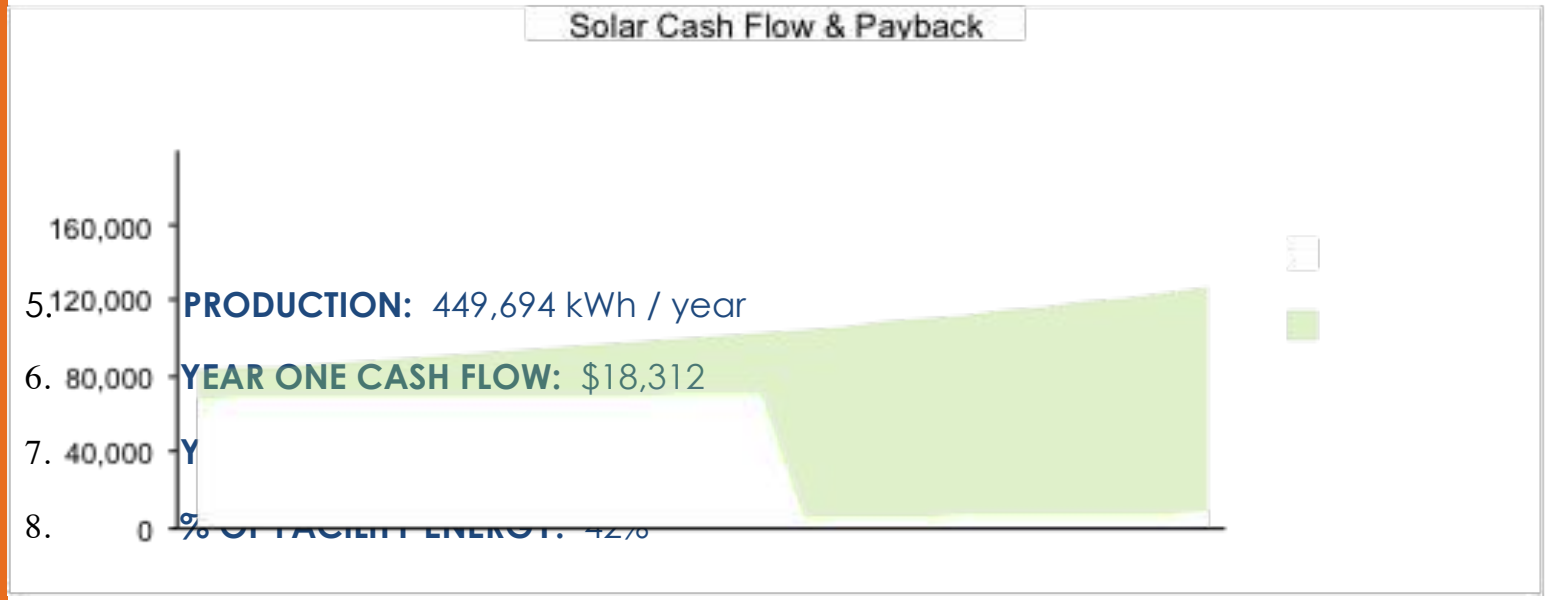


5. **PRODUCTION:** 403,413 kWh / year
6. **YEAR ONE CASH FLOW:** $15,502
7. **YE**
8. **% OF FACILITY ENERGY:** 66%

JJ Lukancic Middle School

SOLAR SYSTEM INFORMATION

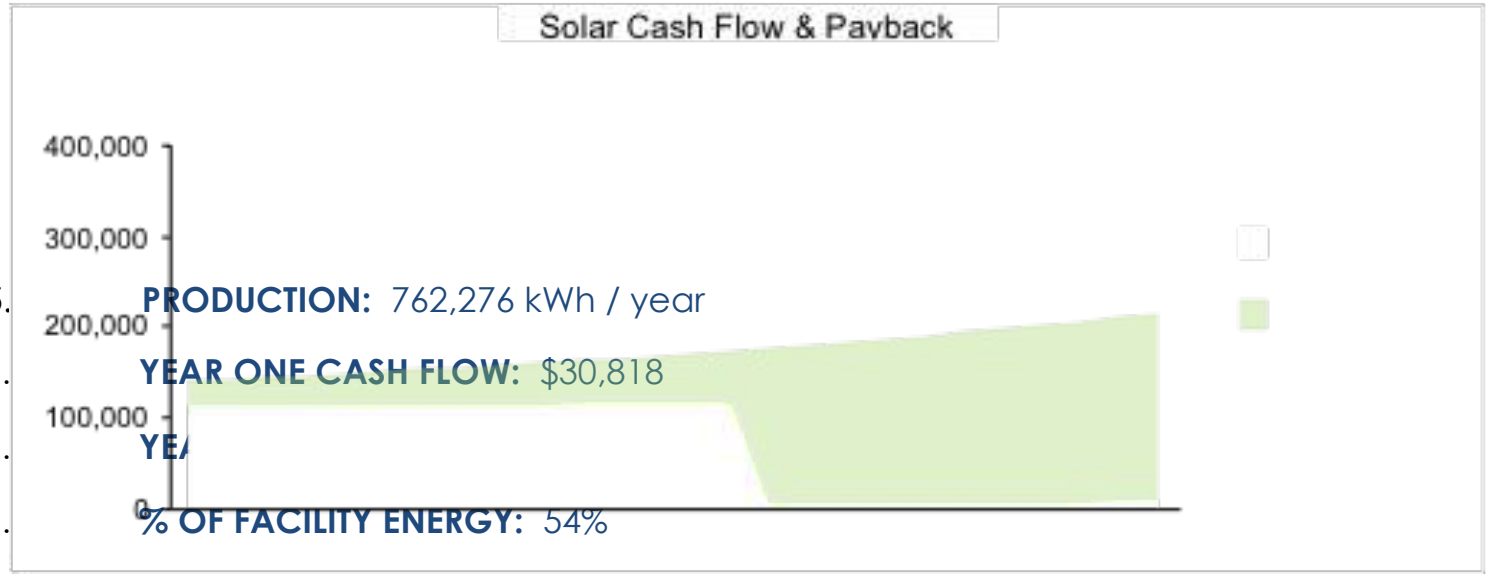
1. **SYSTEM SIZE:** 339.3 kW
2. **INSTALLED PRICE:** $770,251
3. **FINANCED:** 3% over 15 years
4. **ENERGY USE:** 1,064,428 kWh / year
5. **PRODUCTION:** 449,694 kWh / year
6. **YEAR ONE CASH FLOW:** $18,312
7. **Y**
8. **% OF FACILITY ENERGY:** 42%



Jane Addams Middle School

SOLAR SYSTEM INFORMATION

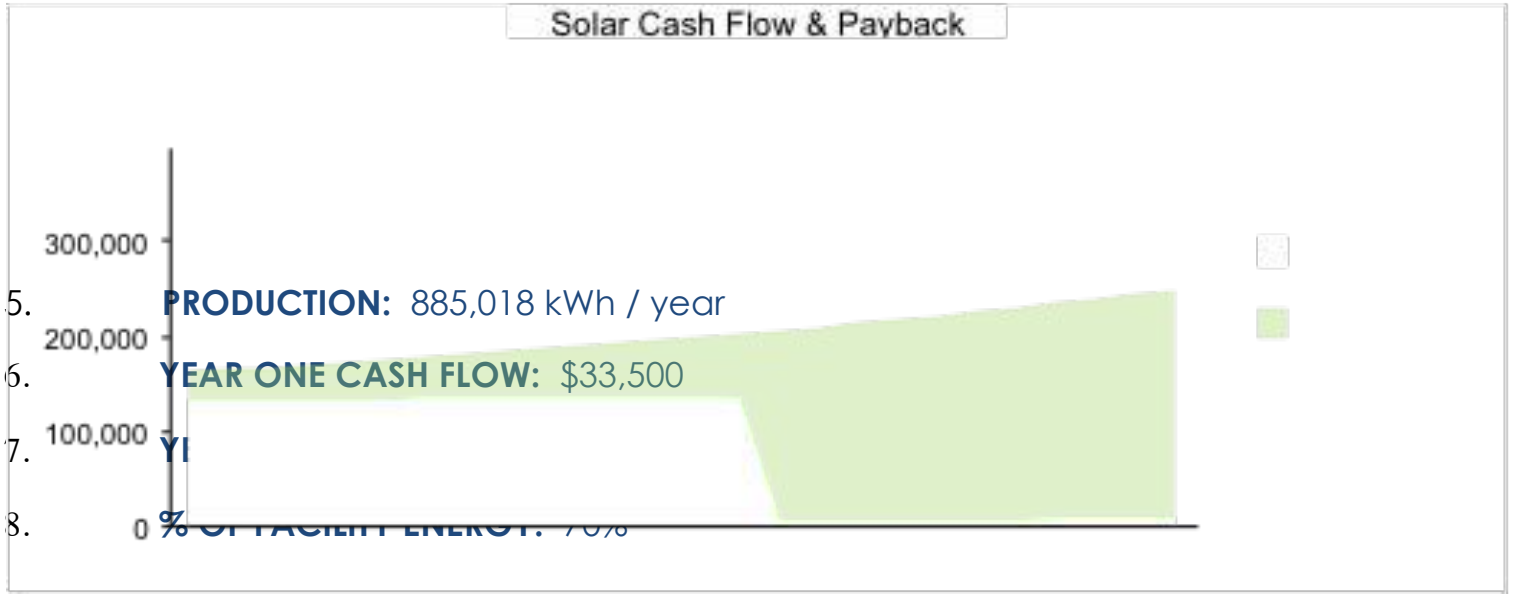
1. **SYSTEM SIZE:** 576.9 kW
2. **INSTALLED PRICE:** $1,308,312
3. **FINANCED:** 3% over 15 years
4. **ENERGY USE:** 1,405,640 kWh / year
5. **PRODUCTION:** 762,276 kWh / year
6. **YEAR ONE CASH FLOW:** $30,818
7. **YE**
8. **% OF FACILITY ENERGY:** 54%



HH Humphrey Middle School

SOLAR SYSTEM INFORMATION

1. **SYSTEM SIZE:** 670.8 kW
2. **INSTALLED PRICE:** $1,546,200
3. **FINANCED:** 3% over 15 years
4. **ENERGY USE:** 1,267,434 kWh / year



5. **PRODUCTION:** 885,018 kWh / year
6. **YEAR ONE CASH FLOW:** $33,500
7. **YI**
8. **% OF FACILITY ENERGY:** 70%

VE SCHOOL SOLAR PROJECT

Spring and Summer 2017


Comparison
kWh/kWp
Deselect all
Time range
2018
PV system
kWh/kWp
kWh
IL - Valley View - Lukancic
1093.97
315063.54
IL - Valley View - Jane Addams
621.69
283488.72
IL - Valley View - Jamie McGee
362.93
87103.81
IL - Valley View - Hubert Humphrey
977.81
539753.78
IL - Valley View - BJ Ward
1012.26
340117.86
Energy [kWh]
250k
225k
200k
175k
150k
125k
100k
75k
50k
25k
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
2018
DAY
MONTH
YEAR
TOTAL

Valley View School District

November 13, 2018