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Solar PV Feasibility Report
Mountain View Whisman School District
April 5, 2018



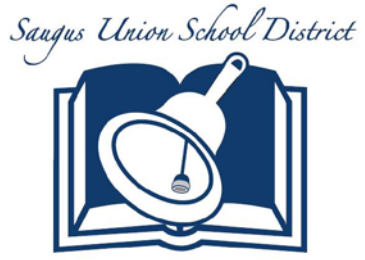
AGENDA

- + Introduction
- + Solar PV Site Analysis
- + Shade Structure Examples
- + Timeline and Next Steps

ABOUT SAGE RENEWABLES

- + ***Founded 2009 in Marin County, California.***
- + ***Independent Consulting Expertise: Owner's representative, we're on your team.***
- + ***Over 300 MW of Renewable Energy Experience: Over 100 public agencies***
- + ***Full project development and support services: Feasibility, financial modeling, contracting, design, construction support, commissioning, operational support***
- + ***Helping clients get the most value from their energy projects.***

EXAMPLE SCHOOL DISTRICT CLIENTS



FEASIBILITY STUDY OVERVIEW

- + Assessed all eleven (11) District Sites for solar PV feasibility
- + Evaluated historical and future energy consumption
- + Developed conceptual system size
- + Performed preliminary financial modeling

FEASIBILITY STUDY FINDINGS SUMMARY

Total Targeted Sites	11 Sites
Estimated Potential Project Size	1,700 kWp
Annual PV Energy Production	2,650,000 kWh/year
Energy Consumption Offset	94%
Utility Bill Offset (Yr-1 %)	75%
Lifetime Carbon Offset (eCO ₂)	13,000 Tons of eCO ₂
Shade Square Footage Added	55,000 sq. ft.

SOLAR PV INSTALLATION TYPES

Shade Structures and Carports	Rooftop
<ul style="list-style-type: none">• DSA Pre-Check (“PC”) Does not require full DSA review (1 day)• Provides shade to student and parking areas• Multiple use of available space	<ul style="list-style-type: none">• Full DSA Review (~ 4-6 months)• No campus footprint impacts• Optimal roof age <10yrs

CANOPY PV DESIGN CONSIDERATIONS

- Large, centrally located, permanent structures
- 20-ft clearance from existing buildings
- Clearance from EVA lanes and shading from trees
- Minimum 12-ft height clearance
- Double cantilever “T” structures most cost effective
- South or Southwest facing optimal production
- Access for large drill rigs for canopy install

ENERGY USAGE – CURRENT AND FUTURE

No.	Site Name	Current Annual Usage (kWh)	Est. Efficiency/ Additional Load Changes (%)	Future Annual Consumption for PV Design (kWh)
1	Crittenden MS	607,000	-14%	522,000
2.	Graham MS	578,000	-4%	554,000
3.	Benjamin Bubb ES	201,000	-23%	155,000
4.	Edith Landels ES	220,000	-19%	178,000
5.	Frank L. Huff ES	182,000	-14%	156,000
6.	Gabriela Mistral ES	187,000	29%	241,000
7.	Mariano Castro ES	187,000	29%	241,000
8.	Monta Loma ES	286,000	-16%	241,000
9.	Stevenson ES	164,000	20%	197,000
10.	Theuerkauf ES	459,000	2%	466,000
11.	District Office	65,000	49%	97,000
Total		2,949,000	-5%	2,807,000

PV SITING, SIZING & PERFORMANCE FINDINGS

No.	Site Name	NEM or NEMA	Year-1 Target PV Production (kWh)	Modeled System Size (kWp)	Year-1 Savings (\$)	Year-1 Bill Offset (%)	Design Canopy Area (SF)
1.	Crittenden MS	NEMA	488,000	320	\$82,000	71%	19,000
2.	Graham MS	NEMA	527,000	335	\$99,000	82%	12,000
3.	Benjamin Bubb ES	NEM	146,000	90	\$23,000	60%	5,000
4.	Edith Landels ES	NEM	168,000	100	\$27,000	65%	6,000
5.	Frank L. Huff ES	NEM	147,000	90	\$24,000	65%	5,000
6.	Gabriela Mistral ES	NEMA	228,000	150	\$41,000	74%	-
7.	Mariano Castro ES						
8.	Monta Loma ES	NEMA	229,000	145	\$47,000	95%	4,000
9.	Stevenson ES						
10.	Theuerkauf ES	NEMA	717,000	470	\$127,000	74%	4,000
11.	District Office						
Total			2,650,000	1,700	\$470,000	75%	55,000

PV SHADE STRUCTURE EXAMPLE



PV SHADE STRUCTURE EXAMPLE



PV CARPORT EXAMPLE



PV CARPORT EXAMPLE



PROJECT RISKS – MITIGATING MEASURES

Market Risks	Mitigation
PG&E Time-of-Use Shift	Submit interconnection applications by December 31, 2017; careful modeling
ITC Stepdown (drops to 26% in 2020, 22% in 2021, and 10% after 2023)	Project installed before 2020
PV Module import tariff (30% in 2018, decreasing by 5%/year, until 2022)	Conservative modeling, +6% project cost
Steel import tariff (25% on foreign steel)	Conservative modeling, +2% project cost
Utility cost escalation is less than expected and/or solar friendly utility rate changes	Risk analysis built into modeling, ongoing advocacy for solar with the CPUC

PROJECT RISKS – MITIGATING MEASURES

Implementation Risks	Mitigation
Contracting Issues	Project specifications in RFP Contract Terms; Technical contract review by Sage; Select second ranked proposer
Poor vendor performance	Design review, construction oversight , commissioning verification by Sage; Performance and Payment bonds
System Performance	Performance Guarantee - 90% or greater with true-ups
Accidental Damage, Vandalism	Strategic panel placement; tamper proof hardware; 12' clearance minimum on parking structures; insurance
Campus reconfiguration, canopies need to be moved	Careful system siting, coordination with District facilities staff and Master Planning; consider Decommissioning Reserve
Neighbor Conflicts	Community outreach meetings early on and throughout

SOLAR PROJECT TIMELINE

	Duration	Cumulative	Calendar	
Phase	Weeks	Weeks	Start	End
RFP Preparation/Release	4	4	July 2018	Aug 2018
Proposal Review/Contracting	10	14	Sep 2018	Oct 2018
Design & OTC DSA Process	24	38	Oct 2018	May 2019
Construction	12	50	Jun 2019	Oct 2019
Commissioning & Closeout	12	62	Oct 2019	Nov 2019

NEXT STEPS

Board decision to move forward with RFP

RFP issued - select best value solar vendor

Contract negotiated with solar PV vendor

Board decision to accept contract

Final design, permitting

Construction

Commissioning and interconnection

Commercial operation and project

For more information:



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