Solar Master Plan

OAKLAND UNIFIED SCHOOL DISTRICT (OUSD)

Chapter 4

Aerial Assessments of Selected Sites

Aerial Assessments of Selected Sites

Aerial Assessments were prepared for each individual district to allow each to integrate renewable energy systems into its Facilities Master Plan. The aerial assessments provide:

- an inventory of solar appropriate schools and facilities
- total annual electricity consumption and cost for the district
- each individual school's electricity annual consumption and cost
- gross and net space available for PV systems
- the maximum PV capacity for each school and the size of the PV systems that will meet 75% of a school's annual electricity consumption (reducing the school's electricity bill to the minimum)
- PV system cost estimates
- estimated rebates and savings from avoided electricity costs
- greenhouse gas emissions avoided and Renewable Energy Credits (RECs) earned

The above assessments will prepare school districts to seek local General Obligation bonds from their constituencies for financing the installation of renewable energy systems in conjunction with other school construction or modernization work.

In addition, when a district identifies the best locations for solar installations and their energy characteristics, it is prepared to take advantage of funding opportunities that may arise, such as low-interest federal bonds, low-interest state loans, or grants from regional agencies to reduce energy consumption and/or greenhouse gas emissions. As the need for renewable energy increases, other opportunities are sure to emerge. Districts that plan and assess their schools and facilities for renewable energy will be in a good position to take advantage of future funding opportunities.

SunPower Corporation, Richmond CA prepared the aerial assessments in consultation with the individual school districts. KyotoUSA volunteers assembled the electricity consumption and cost information from data provided by PG&E via Energy Star's Portfolio Manager.

The aerial assessment information in this chapter is specific to the school district for which this individual Solar Master Plan was prepared.

OAKLAND UNIFIED SCHOOL DISTRICT
expect Success

Oakland Unified School District Solar Site Assessments

updated May 2012

SECTION ONE

- Assumptions and Benefits
- Roof Utilization Factors
- System Cost
- Scenario 1: Installing Maximum Capacity
- Scenario 2: Offsetting Electricity Costs Only

Assumptions and Benefits

Assumptions

All information is preliminary and intended to provide OUSD with estimates of PV system sizes, siting possibilities, production values, incentives, avoided electricity costs, and installation costs.

1. Annual electricity consumption and cost were provided by PG&E via Portfolio Manager. Twelve month periods vary slightly – ending in either May or June 2011.

2. Assumed PG&E Electric Rate A6 yielding year 1 solar savings = $0.19/kWh.

3. CSI incentive assumed at Step 10 at $0.088 per kWh, except for 17 schools for which the District has made rebate reservations. For these schools the rebate level is Step 8 at $0.139 per kWh. See Appendix C for the list of these schools. The CSI rebates are likely to be exhausted for PGE non-residential customers by the end of 2012.

4. **Scenario 1** "Installing Maximum Capacity" Based on aerial assessments done by SunPower Corporation which shows how much solar each site is capable of hosting. Assumes a total cost per Wp as indicated in the System Pricing chart on page 5. System pricing is based on the use of SunPower's high efficiency solar panels and estimated based on SunPower pricing for installation in the second quarter of 2013.

   Scenario 2 "Offsets Electricity Costs Only" Based on estimated PV system size that would eliminate electricity bill. (PV systems are typically designed to produce 75% of consumption, thus "zeroing out" a building's electricity expense.) Assumes a total cost per Wp as indicated in the System Pricing chart on page 5. System pricing is based on the use of SunPower's high efficiency solar panels and estimated based on SunPower pricing for installation in the second quarter of 2013.

5. Year one electric yield = 1,350 kWh per kWp. (This is a conservative estimate of yield. SunPower's newest panels are producing ~1,450 kWh per watt. Calculations in this report are based on the yield = 1,350 kWh.)

6. Size and location of PV systems may vary significantly after design completion

7. Electric costs and consumption are combined for all electric meters at each site and shown as a single total value. Further analysis is needed to evaluate impact of PV system on electric meter(s) where PV system will be connected.

Benefits

If the District installs PV systems as described in Scenario 2 (Offset Only), the following estimated benefits will accrue:

- Annual savings: $2,892,747
- Annual electricity production: 15,224,986 kWh
- Annual greenhouse gases avoided: 3,867 metric tons*
- Annual Renewable Energy Credits (RECs) earned: 15,225

*Avoided greenhouse gases were calculated by multiplying the number of kWh produced by the PV system by PG&E's estimated emissions factor for electricity for 2010–2011.

kWh x 0.000254

Roof Utilization Factors

Methodology

To determine how much electricity can be generated from a school rooftop or from a structure in a parking lot, it is necessary to determine how much usable space is available. Solar panel efficiency is affected by shadows cast by surrounding hills, buildings, trees, flagpoles, other obstructions, as well as equipment, conduit, walls, or structures placed on a roof. When a solar project is contemplated, it is important to determine if the roof or parking lot is free of shadow casting obstructions, making it possible to install a renewable energy system that will produce enough electricity to make the project viable. A school district does not have to make this determination on its own. A district can hire its own consultant to evaluate roof and parking lot conditions before soliciting bids for a renewable energy project or it can simply leave that determination to the Design-Build Request for Proposal process described elsewhere in this document.

For our aerial assessments shown here, SunPower Corporation used Google Map images of all district schools and facilities. District officials then reviewed the aerial photos with SunPower staff to determine which schools should be assessed. In some cases, schools were slated for closure, in other cases the schools were being razed and a new facility was planned, and in several cases, the orientation of the roof, its height, or the amount of equipment on it, made it an unlikely candidate for the installation of solar panels.

Once the appropriate schools and facilities were identified, SunPower Corporation used a web tool to outline the most appropriate sites. This tool is able to estimate the amount of square feet available (gross) on a roof or parking lot. Then technicians applied the "roof utilization factors" in the chart on the right to estimate how much of the total space could be used (net) for solar panel arrays. Once this calculation was made, it was possible to determine how many panels could be installed and what their estimated output would be.

SunPower Corporation used conservative estimates for the "roof utilization factors" which means that it may be possible to install more PV than is described here. It is also the case that once a physical inspection of a roof or parking area is made, the district may find that there is less space for a PV installation. It is important to keep in mind that these calculations presented here are estimates based on an assessment of aerial imagery. The information included here is intended to be a guide for the district and should be relied on in that context only.

ROOF UTILIZATION FACTORS	
Clear	75%
Minimal	63%
Moderate	50%
Significant	38%

System Cost

The turn-key cost of a PV system is frequently described as the cost per Watt peak or "$/Wp." The primary factors that make up that cost are: equipment, design, permitting, installation, labor costs, commissioning, warranties, guarantees, and maintenance services. Other products may be included in the $/Wp, e.g. educational component, or provided as a separate cost.

Roof mounted systems are generally less expensive than carport or shade structures.

The size of the PV project is also a factor in its cost. Generally, the larger the PV system, the lower the $/watt cost. This means that a district should benefit by aggregating its PV projects rather than doing them invididually.

See the chapter on the "Design-Build Contract for Photovoltaic Systems Installation" for a fuller description of the elements that make up the turn-key cost of a PV system.

SYSTEM SIZE	COST FOR 2ND QUARTER 2013 ($/Wp)
Roof (100-250 kWp)	$5.20
Roof (250-500 kWp)	$4.90
Roof (500-750 kWp)	$4.60
Roof (750-1000 kWp)	$4.50
Carport (100-250 kWp)	$6.00
Carport (250-500 kWp)	$5.90

Scenarios

These two tables summarize the data described in the individual school and facility assessments that follow. Scenario 1 demonstrates the total estimated potential PV capacity for the district. Scenario 2 demonstrates the estimated PV capacity when the PV system is sized to produce 75% of the school's consumption — an amount that brings the school's electricity cost close to $0.

Note:
In our Scenario 2 assessment, we have treated schools and other district facilities similarly, i.e. we have sought to achieve PV system sizing that would result in an offset of 75% of a building's electrical load. For any school or non-school facility that is operated year round, the PV system sizing target should be based on a more thorough analysis of the building load profile.

SCENARIO 1 INSTALLING MAXIMUM CAPACITY*	
Estimated Gross Available Area (ft^2)	2,332,401
Net Available Area (ft^2)	1,149,574
Potential PV Capacity (kWp)	19,520
Estimated PV Production (Annual kWh)	26,352,000
Estimated Year 1 Savings	$5,006,880
Estimated Cost	$98,063,000
Estimated CSI Rebate	$13,371,088
Net Cost	$84,691,912

**Based on aerial assessments done by SunPower Corporation which shows how much solar each site is capable of hosting.*

SCENARIO 2 OFFSETS ELECTRICITY COSTS ONLY	
Estimated Gross Available Area (ft^2)	2,332,401
Net Available Area (ft^2)	1,149,574
Potential PV Capacity (kWp)	11,278
Estimated PV Production (Annual kWh)	15,224,986
Estimated Year 1 Savings	$2,892,747
Estimated Cost	$58,150,647
Estimated CSI Rebate	$8,161,829
Net Cost	$49,988,818

Scenario 1:
Installing Maximum Capacity

SCHOOL	ESTIMATED PV CAPACITY (FULL SCALE) (kWp)	ESTIMATED PV PRODUCTION (kWh)	ANNUAL USAGE OFFSET	ESTIMATED COST OF FULL SCALE PV SYSTEM	ESTIMATED REBATE	NET COST
Allendale Elementary	330	445,500	259%	$1,617,000	$194,070	$1,422,930
Ascend Elementary	130	175,500	43%	$676,000	$76,452	$599,548
Bella Vista	150	202,500	120%	$780,000	$88,213	$691,787
Bret Harte Middle	360	486,000	103%	$1,764,000	$334,409	$1,429,591
Brookfield Elementary	440	594,000	248%	$2,156,000	$258,759	$1,897,241
Bunche Academy	220	297,000	183%	$1,144,000	$129,380	$1,014,620
Burbank Middle	250	337,500	341%	$1,225,000	$147,022	$1,077,978
Carl Munck Elementary	280	378,000	257%	$1,372,000	$164,665	$1,207,335
Carter/Oakland Int'l High School	170	229,500	38%	$884,000	$157,915	$726,085
Castlemont	870	1,174,500	82%	$4,418,000	$808,156	$3,609,844
Cesar Chavez Elementary	140	189,000	39%	$728,000	$82,333	$645,667
Claremont Middle	140	189,000	64%	$728,000	$130,048	$597,952
Cleveland Elementary	200	270,000	168%	$1,040,000	$117,618	$922,382
Cox Elementary	330	445,500	384%	$1,617,000	$194,070	$1,422,930
Crocker Elementary	190	256,500	196%	$988,000	$111,737	$876,263
Dewey Academy	180	243,000	115%	$936,000	$105,856	$830,144
Edna Brewer Middle	350	472,500	125%	$1,715,000	$325,120	$1,389,880
Elmhurst Community Prep	310	418,500	135%	$1,519,000	$182,308	$1,336,692

Installing Maximum Capacity = estimated PV capacity at each school based on available roof space and parking lots.

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Scenario 1:
Installing Maximum Capacity *continued*

SCHOOL	ESTIMATED PV CAPACITY (FULL SCALE) (kWp)	ESTIMATED PV PRODUCTION (kWh)	ANNUAL USAGE OFFSET	ESTIMATED COST OF FULL SCALE PV SYSTEM	ESTIMATED REBATE	NET COST
Emerson Elementary	140	189,000	102%	$728,000	$82,333	$645,667
Esperanza (Stonehurst Campus)	190	256,500	68%	$988,000	$111,737	$876,263
Franklin Elementary	440	594,000	235%	$2,156,000	$258,759	$1,897,241
Fremont High School	280	378,000	26%	$1,576,000	$260,096	$1,315,904
Frick Middle	540	729,000	191%	$2,484,000	$317,568	$2,166,432
Fruitvale Elementary	180	243,000	121%	$936,000	$105,856	$830,144
Garfield Elementary	320	432,000	133%	$1,568,000	$188,189	$1,379,811
Glenview Elementary	120	162,000	127%	$624,000	$70,571	$553,429
Grass Valley Elementary	140	189,000	164%	$728,000	$82,333	$645,667
Havenscourt Middle	150	202,500	43%	$780,000	$139,337	$640,663
Hillcrest Elementary	200	270,000	270%	$1,040,000	$117,618	$922,382
Hoover Elementary	90	121,500	71%	$468,000	$52,928	$415,072
Horace Mann Elementary	180	243,000	122%	$936,000	$105,856	$830,144
Howard Elementary	510	688,500	484%	$2,346,000	$299,926	$2,046,074
Jefferson	200	270,000	83%	$1,040,000	$117,618	$922,382
Joaquin Miller Elementary	150	202,500	141%	$780,000	$88,213	$691,787
Kaiser Elementary	100	135,000	175%	$520,000	$58,809	$461,191
Kings Estate Middle	410	553,500	177%	$2,009,000	$380,855	$1,628,145

Installing Maximum Capacity = estimated PV capacity at each school based on available roof space and parking lots.

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Scenario 1:
Installing Maximum Capacity *continued*

SCHOOL	ESTIMATED PV CAPACITY (FULL SCALE) (kWp)	ESTIMATED PV PRODUCTION (kWh)	ANNUAL USAGE OFFSET	ESTIMATED COST OF FULL SCALE PV SYSTEM	ESTIMATED REBATE	NET COST
Lafayette Elementary	200	270,000	176%	$1,040,000	$117,618	$922,382
Laurel Elementary	130	175,500	105%	$676,000	$76,452	$599,548
Life Academy	80	108,000	42%	$416,000	$47,047	$368,953
Lincoln Elementary	240	324,000	258%	$1,248,000	$141,142	$1,106,858
Lockwood Elementary	440	594,000	253%	$2,472,000	$258,759	$2,213,241
Longfellow	270	364,500	177%	$1,323,000	$158,784	$1,164,216
Lowell Middle	310	418,500	115%	$1,519,000	$287,963	$1,231,037
Madison Middle	480	648,000	199%	$2,352,000	$282,283	$2,069,717
Manzanita	300	405,000	122%	$1,470,000	$176,427	$1,293,573
Markham Elementary	210	283,500	164%	$1,092,000	$123,499	$968,501
Marshall Elementary	120	162,000	97%	$624,000	$70,571	$553,429
McClymonds High	490	661,500	109%	$2,522,000	$455,168	$2,066,832
Melrose Elementary	160	216,000	127%	$832,000	$94,094	$737,906
MLK Jr Elementary	480	648,000	179%	$2,352,000	$282,283	$2,069,717
Montclair Elementary	170	229,500	121%	$884,000	$99,975	$784,025
Montera Middle	290	391,500	91%	$1,421,000	$269,385	$1,151,615
New Highland Academy	150	202,500	56%	$780,000	$88,213	$691,787
Oakland High	340	459,000	27%	$1,666,000	$315,831	$1,350,169
Oakland Tech	590	796,500	63%	$2,714,000	$548,060	$2,165,940

Installing Maximum Capacity = estimated PV capacity at each school based on available roof space and parking lots.

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Scenario 1:
Installing Maximum Capacity *continued*

SCHOOL	ESTIMATED PV CAPACITY (FULL SCALE) (kWp)	ESTIMATED PV PRODUCTION (kWh)	ANNUAL USAGE OFFSET	ESTIMATED COST OF FULL SCALE PV SYSTEM	ESTIMATED REBATE	NET COST
Parker Elementary	150	202,500	126%	$780,000	$88,213	$691,787
Piedmont Elementary	140	189,000	113%	$728,000	$82,333	$645,667
Prescott/Prep Literary Academy	210	283,500	87%	$1,092,000	$123,499	$968,501
Roosevelt Middle	380	513,000	101%	$1,862,000	$352,987	$1,509,013
Rusdale Continuation	200	270,000	286%	$1,040,000	$117,618	$922,382
Santa Fe Elementary	190	256,500	167%	$988,000	$176,494	$811,506
Sequoia Elementary	130	175,500	111%	$676,000	$76,452	$599,548
Sherman	130	175,500	165%	$676,000	$76,452	$599,548
Simmons Middle	200	270,000	57%	$1,040,000	$117,618	$922,382
Skyline High	480	648,000	54%	$2,734,000	$282,283	$2,451,717
Sobrante Park Elementary	290	391,500	315%	$1,421,000	$170,546	$1,250,454
Special Ed Admin	210	283,500	66%	$1,092,000	$123,499	$968,501
Thornhill Elementary	150	202,500	182%	$780,000	$88,213	$691,787
Tilden Elementary	90	121,500	69%	$468,000	$52,928	$415,072
Urban Promise Academy	180	243,000	177%	$936,000	$105,856	$830,144
Warehouse	950	1,282,500	308%	$4,275,000	$558,685	$3,716,315
Westlake Middle	230	310,500	74%	$1,196,000	$213,650	$982,350
Whittier Elementary	380	513,000	339%	$1,862,000	$223,474	$1,638,526
Total	**19,520**	**26,352,000**	**109%**	**$98,063,000**	**$13,371,088**	**$84,691,912**

Installing Maximum Capacity = estimated PV capacity at each school based on available roof space and parking lots.

Scenario 2:
Offsetting Electricity Costs Only

SCHOOLS	RECOMMENDED PV CAPACITY (OFFSET ONLY) (kWp)	ESTIMATED PV PRODUCTION TO MATCH ANNUAL COST (kWh)	ANNUAL USAGE OFFSET BY SOLAR	ESTIMATED COST OF "OFFSET ONLY" PV SYSTEM	ESTIMATED REBATE	NET COST
Allendale Elementary	96	129,240	75%	$497,813	$56,300	$441,514
*Ascend Elementary	130	175,500	43%	$676,000	$76,452	$599,548
Bella Vista	94	126,937	75%	$488,942	$55,296	$433,645
Bret Harte Middle	262	353,940	75%	$1,284,671	$243,541	$1,041,130
Brookfield Elementary	133	179,529	75%	$691,519	$78,207	$613,312
Bunche Academy	90	121,800	75%	$469,156	$53,059	$416,097
Burbank Middle	55	74,250	75%	$286,000	$32,345	$253,655
Carl Munck Elementary	82	110,130	75%	$424,204	$47,975	$376,229
*Carter/Oakland Int'l High School	170	229,500	38%	$884,000	$157,915	$726,085
Castlemont	796	1,074,091	75%	$4,006,000	$739,065	$3,266,935
*Cesar Chavez Elementary	140	189,000	39%	$728,000	$82,333	$645,667
*Claremont Middle	140	189,000	64%	$728,000	$130,048	$597,952
Cleveland Elementary	90	120,840	75%	$465,458	$52,641	$412,817
Cox Elementary	64	87,002	75%	$335,117	$37,900	$297,217
Crocker Elementary	73	98,220	75%	$378,329	$42,787	$335,542
Dewey Academy	117	157,950	75%	$608,400	$68,806	$539,594
Edna Brewer Middle	210	283,920	75%	$1,093,618	$195,361	$898,257
Elmhurst Comm Prep	172	231,840	75%	$893,013	$100,995	$792,019

Offsetting Electricity Costs Only = estimated PV capacity at each school based on current energy consumption.

* These schools may not have the physical capacity to site a PV system of the size needed to offset the cost of the school's consumption. The chart reflects the PV system sizes for these schools that are consistent with the available space. See "Contextual Data" in the sidebars for the PV system size that would offset the school's current electricity consumption.

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Scenario 2:
Offsetting Electricity Costs Only *continued*

SCHOOL	RECOMMENDED PV CAPACITY (OFFSET ONLY) (kWp)	ESTIMATED PV PRODUCTION TO MATCH ANNUAL COST (kWh)	ANNUAL USAGE OFFSET BY SOLAR	ESTIMATED COST OF "OFFSET ONLY" PV SYSTEM	ESTIMATED REBATE	NET COST
Emerson Elementary	103	138,960	75%	$535,253	$60,534	$474,719
*Esperanza (Stonehurst)	190	256,500	68%	$988,000	$111,737	$876,263
Franklin Elementary	141	189,810	75%	$731,120	$82,685	$648,435
*Fremont High School	280	378,000	26%	$1,576,000	$260,096	$1,315,904
Frick Middle	212	285,540	75%	$1,099,858	$124,388	$975,470
Fruitvale Elementary	112	151,110	75%	$582,053	$65,827	$516,226
Garfield Elementary	180	243,000	75%	$936,000	$105,856	$830,144
Glenview Elementary	71	96,030	75%	$369,893	$41,833	$328,061
Grass Valley Elementary	64	86,430	75%	$332,916	$37,651	$295,265
*Havenscourt Middle	150	202,500	43%	$780,000	$139,337	$640,663
Hillcrest Elementary	56	75,000	75%	$288,889	$32,672	$256,217
*Hoover Elementary	90	121,500	71%	$468,000	$52,928	$415,072
Horace Mann Elementary	111	149,400	75%	$575,467	$65,082	$510,385
Howard Elementary	79	106,680	75%	$410,916	$46,472	$364,443
Jefferson	182	245,040	75%	$943,858	$106,745	$837,113
Joaquin Miller Elementary	80	107,760	75%	$415,076	$46,943	$368,133
Kaiser Elementary	43	57,900	75%	$223,022	$25,223	$197,800
Kings Estate Middle	174	234,900	75%	$904,800	$161,631	$743,169

Offsetting Electricity Costs Only = estimated PV capacity at each school based on current energy consumption.

* These schools may not have the physical capacity to site a PV system of the size needed to offset the cost of the school's consumption. The chart reflects the PV system sizes for these schools that are consistent with the available space. See "Contextual Data" in the sidebars for the PV system size that would offset the school's current electricity consumption.

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Scenario 2:
Offsetting Electricity Costs Only *continued*

SCHOOL	RECOMMENDED PV CAPACITY (OFFSET ONLY) (kWp)	ESTIMATED PV PRODUCTION TO MATCH ANNUAL COST (kWh)	ANNUAL USAGE OFFSET BY SOLAR	ESTIMATED COST OF "OFFSET ONLY" PV SYSTEM	ESTIMATED REBATE	NET COST
Lafayette Elementary	85	115,200	75%	$443,733	$50,184	$393,550
Laurel Elementary	93	125,100	75%	$481,867	$54,496	$427,370
*Life Academy	80	108,000	42%	$416,000	$47,047	$368,953
Lincoln Elementary	70	94,350	75%	$363,422	$41,101	$322,321
Lockwood Elementary	130	175,920	75%	$677,618	$76,635	$600,983
Longfellow	114	154,320	75%	$594,418	$67,225	$527,193
Lowell Middle	203	273,458	75%	$1,053,318	$188,162	$865,156
Madison Middle	181	244,620	75%	$942,240	$106,562	$835,678
Manzanita	184	249,000	75%	$959,111	$108,470	$850,641
Markham Elementary	96	129,600	75%	$499,200	$56,457	$442,743
Marshall Elementary	93	125,460	75%	$483,253	$54,653	$428,600
McClymonds High	337	455,449	75%	$1,653,110	$313,387	$1,339,723
Melrose Elementary	94	127,440	75%	$490,880	$55,516	$435,364
MLK Jr Elementary	201	271,440	75%	$1,045,547	$118,245	$927,301
Montclair Elementary	105	142,392	75%	$548,473	$62,029	$486,444
Montera Middle	238	321,205	75%	$1,237,233	$221,016	$1,016,217
*New Highland Academy	150	202,500	56%	$780,000	$88,213	$691,787
*Oakland High	340	459,000	27%	$1,666,000	$315,831	$1,350,169
*Oakland Tech	590	796,500	63%	$2,714,000	$548,060	$2,165,940

Offsetting Electricity Costs Only = estimated PV capacity at each school based on current energy consumption.

* These schools may not have the physical capacity to site a PV system of the size needed to offset the cost of the school's consumption. The chart reflects the PV system sizes for these schools that are consistent with the available space. See "Contextual Data" in the sidebars for the PV system size that would offset the school's current electricity consumption.

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Scenario 2:
Offsetting Electricity Costs Only *continued*

SCHOOL	RECOMMENDED PV CAPACITY (OFFSET ONLY) (kWp)	ESTIMATED PV PRODUCTION TO MATCH ANNUAL COST (kWh)	ANNUAL USAGE OFFSET BY SOLAR	ESTIMATED COST OF "OFFSET ONLY" PV SYSTEM	ESTIMATED REBATE	NET COST
Parker Elementary	89	120,720	75%	$464,996	$52,588	$412,407
Piedmont Elementary	93	125,640	75%	$483,947	$54,732	$429,215
Prescott/Prep Literary Academy	181	244,440	75%	$941,547	$106,483	$835,063
Roosevelt Middle	282	380,880	75%	$1,382,453	$262,078	$1,120,376
Rusdale Continuation	53	70,920	75%	$273,173	$30,894	$242,279
Santa Fe Elementary	86	115,440	75%	$444,658	$79,433	$365,225
Sequoia Elementary	88	118,680	75%	$457,138	$51,700	$405,438
Sherman	59	79,980	75%	$308,071	$34,841	$273,230
*Simmons Middle	200	270,000	57%	$1,040,000	$117,618	$922,382
*Skyline High	480	648,000	54%	$2,734,000	$282,283	$2,451,717
Sobrante Park Elementary	69	93,330	75%	$359,493	$40,657	$318,837
*Special Ed Admin	210	283,500	66%	$1,092,000	$123,499	$968,501
Thornhill Elementary	62	83,610	75%	$322,053	$36,422	$285,631
*Tilden Elementary	90	121,500	69%	$468,000	$52,928	$415,072
Urban Promise Academy	76	102,745	75%	$395,758	$44,758	$351,000
Warehouse	231	311,880	75%	$1,201,316	$135,862	$1,065,454
*Westlake Middle	230	310,500	74%	$1,196,000	$213,650	$982,350
Whittier Elementary	84	113,520	75%	$437,262	$49,452	$387,810
Total	**11,278**	**15,224,986**	**63%**	**$58,150,647**	**$8,161,829**	**$49,988,818**

Offsetting Electricity Costs Only = estimated PV capacity at each school based on current energy consumption.

* These schools may not have the physical capacity to site a PV system of the size needed to offset the cost of the school's consumption. The chart reflects the PV system sizes for these schools that are consistent with the available space. See "Contextual Data" in the sidebars for the PV system size that would offset the school's current electricity consumption.

SECTION TWO

- **PV Capacity and Cost Breakdown by Individual School**

Key to Presentation of Data

SOLAR AMERICA SHOWCASE REPORT
Oakland Unified School District

Allendale Elementary

3670 Penniman Avenue

Annual Electricity Cost and Consumption
Cost: $29,014
Consumption: 172,320 kWh

Contextual Data
- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: *minimal*

Greenhouse Gases Avoided Annually:
33 metric tons

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE (STEP 9)	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	11,850	120		120				
Roof B	19,040	210		210				
Totals	**30,890**	**330**	**0**	**330**	**$1,904,100**	**$264,640**	**445,500**	**259%**
System size and pricing to meet current electricity demand				**96**	**$593,547**	**$77,544**	**129,240**	**75%**

Data for Scenario 1: Installing Maximum Capacity

Data for Scenario 2: Offsetting Electricity Costs Only

Allendale Elementary

3670 Penniman Avenue

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	11,850	120		120				
Roof B	19,040	210		210				
Totals	**30,890**	**330**	**0**	**330**	**$1,617,000**	**$194,070**	**445,500**	**259%**
System size and pricing to meet current electricity demand				**96**	**$497,813**	**$56,300**	**129,240**	**75%**

Annual Electricity Cost and Consumption
Cost: $29,014
Consumption: 172,320 kWh

Contextual Data

- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***minimal***

Greenhouse Gases Avoided Annually:
33 metric tons

Renewable Energy Credits Generated Annually:
129

Ascend Elementary

3709 East 12th Street

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	26,125	130		130				
Totals	**26,125**	**130**	**0**	**130**	**$676,000**	**$76,452**	**175,500**	**43%**
System size and pricing to meet current electricity demand				*	*	*	*	*

*Estimated PV capacity is not enough to offset current electricity consumption

Annual Electricity Cost and Consumption
Cost: $63,924
Consumption: 403,840 kWh

Contextual Data

- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***significant***
- A system size of ~224 kWp would produce ~75% of the school's load.

Greenhouse Gases Avoided Annually:
45 metric tons

Renewable Energy Credits Generated Annually:
176

Bella Vista

1025 East 28th Street

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	19,950	150		150				
Totals	**19,950**	**150**	**0**	**150**	**$780,000**	**$88,213**	**202,500**	**120%**
System size and pricing to meet current electricity demand				**94**	**$488,942**	**$55,296**	**126,937**	**75%**

Annual Electricity Cost and Consumption
Cost: $30,124
Consumption: 169,249 kWh

Contextual Data

- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***moderate–significant***

Greenhouse Gases Avoided Annually:
32 metric tons

Renewable Energy Credits Generated Annually:
127

Bret Harte Middle School

2874 Florida Street

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	12,600	130		130				
Roof B	11,700	100		100				
Roof C	12,000	130		130				
Totals	**36,300**	**360**	**0**	**360**	**$1,764,000**	**$334,409**	**486,000**	**103%**
System size and pricing to meet current electricity demand				**262**	**$1,284,671**	**$243,541**	**353,940**	**75%**

Annual Electricity Cost and Consumption
Cost: $72,353
Consumption: 471,920 kWh

Contextual Data

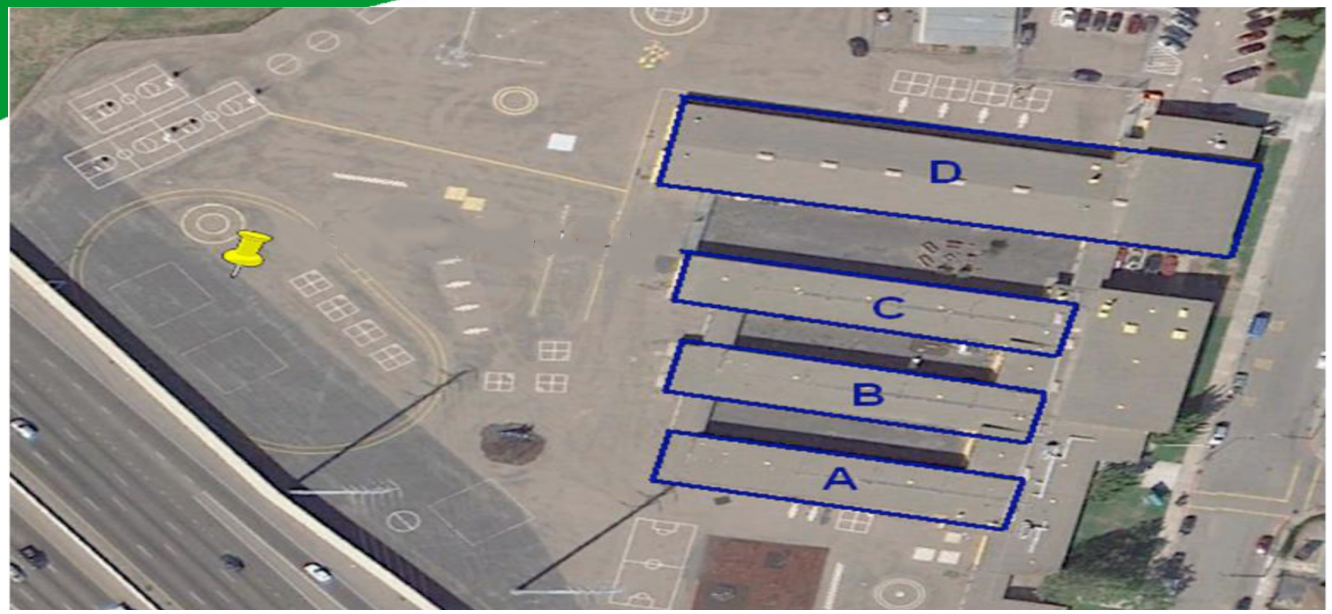
- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***minimal–moderate***

Greenhouse Gases Avoided Annually:
90 metric tons

Renewable Energy Credits Generated Annually:
354

Brookfield Elementary

401 Jones Avenue



LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	7,200	70		70				
Roof B	7,600	80		80				
Roof C	7,600	80		80				
Roof D	21,000	210		210				
Totals	**43,400**	**440**	**0**	**440**	**$2,156,000**	**$258,759**	**594,000**	**248%**
System size and pricing to meet current electricity demand				**133**	**$691,519**	**$78,207**	**179,529**	**75%**

Annual Electricity Cost and Consumption
Cost: $39,200
Consumption: 239,372 kWh

Contextual Data

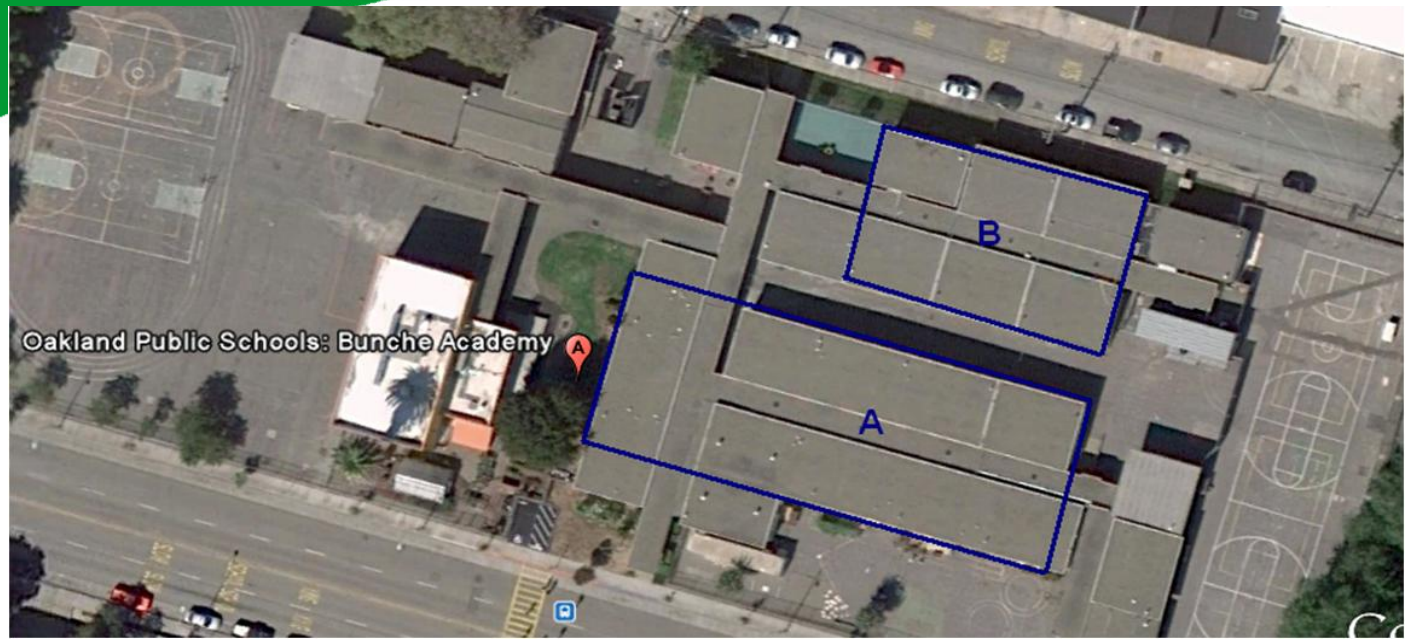
- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***minimal***

Greenhouse Gases Avoided Annually:
46 metric tons

Renewable Energy Credits Generated Annually:
180

Bunche Academy

1240 18th Street



LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	14,308	150		150				
Roof B	7,260	70		70				
Totals	**21,568**	**220**	**0**	**220**	**$1,144,000**	**$129,380**	**297,000**	**183%**
System size and pricing to meet current electricity demand				**90**	**$469,156**	**$53,059**	**121,800**	**75%**

Annual Electricity Cost and Consumption
Cost: $28,167
Consumption: 162,400 kWh

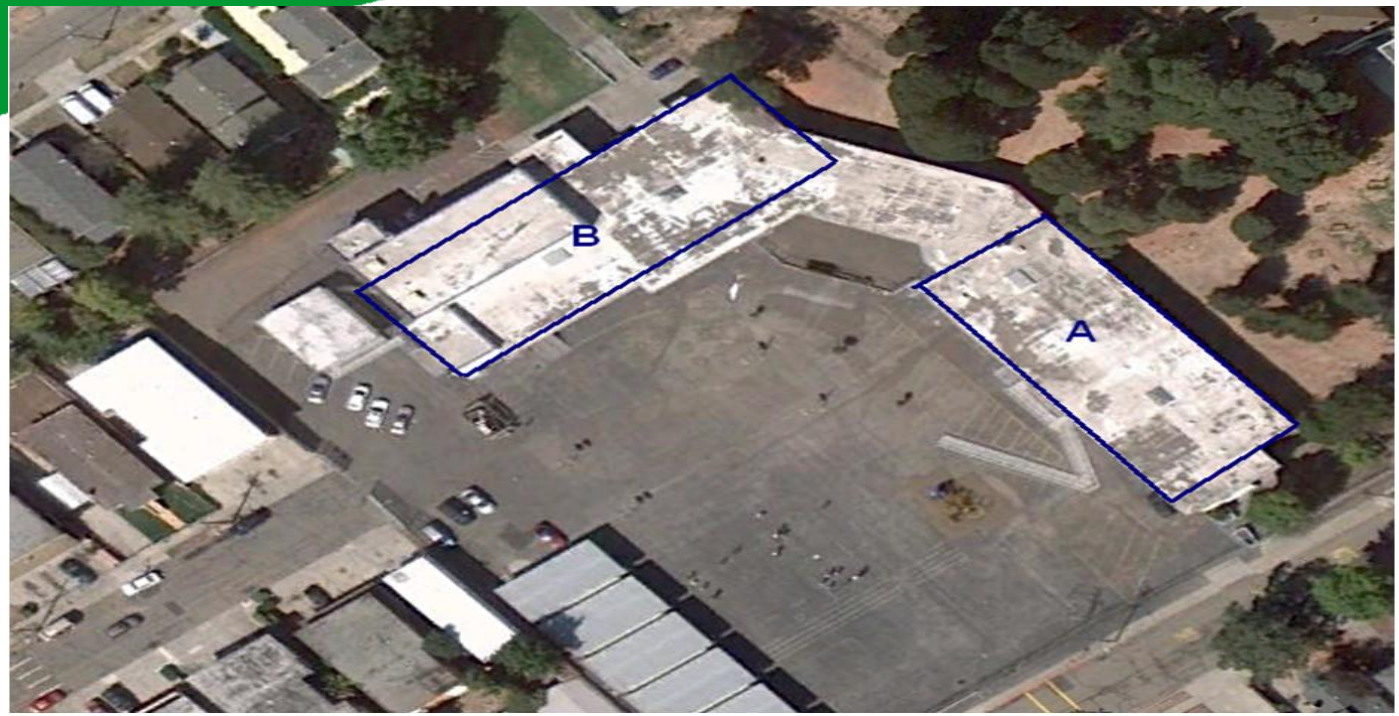
Contextual Data
- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***minimal***

Greenhouse Gases Avoided Annually:
31 metric tons

Renewable Energy Credits Generated Annually:
122

Burbank Middle School

3550 64th Avenue



LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	9,750	120		120				
Roof B	11,900	130		130				
Totals	**21,650**	**250**	**0**	**250**	**$1,225,000**	**$147,022**	**337,500**	**341%**
System size and pricing to meet current electricity demand				**55**	**$286,000**	**$32,345**	**74,250**	**75%**

Annual Electricity Cost and Consumption
Cost: $19,075
Consumption: 99,000 kWh

Contextual Data

- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***clear–minimal***

Greenhouse Gases Avoided Annually:
19 metric tons

Renewable Energy Credits Generated Annually:
74

Carl Munck Elementary

5000 Redwood Road

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	27,500	230		230				
Roof B	5,000	50		50				
Totals	**32,500**	**280**	**0**	**280**	**$1,372,000**	**$164,665**	**378,000**	**257%**
System size and pricing to meet current electricity demand				**82**	**$424,204**	**$47,975**	**110,130**	**75%**

Annual Electricity Cost and Consumption
Cost: $26,646
Consumption: 146,840 kWh

Contextual Data

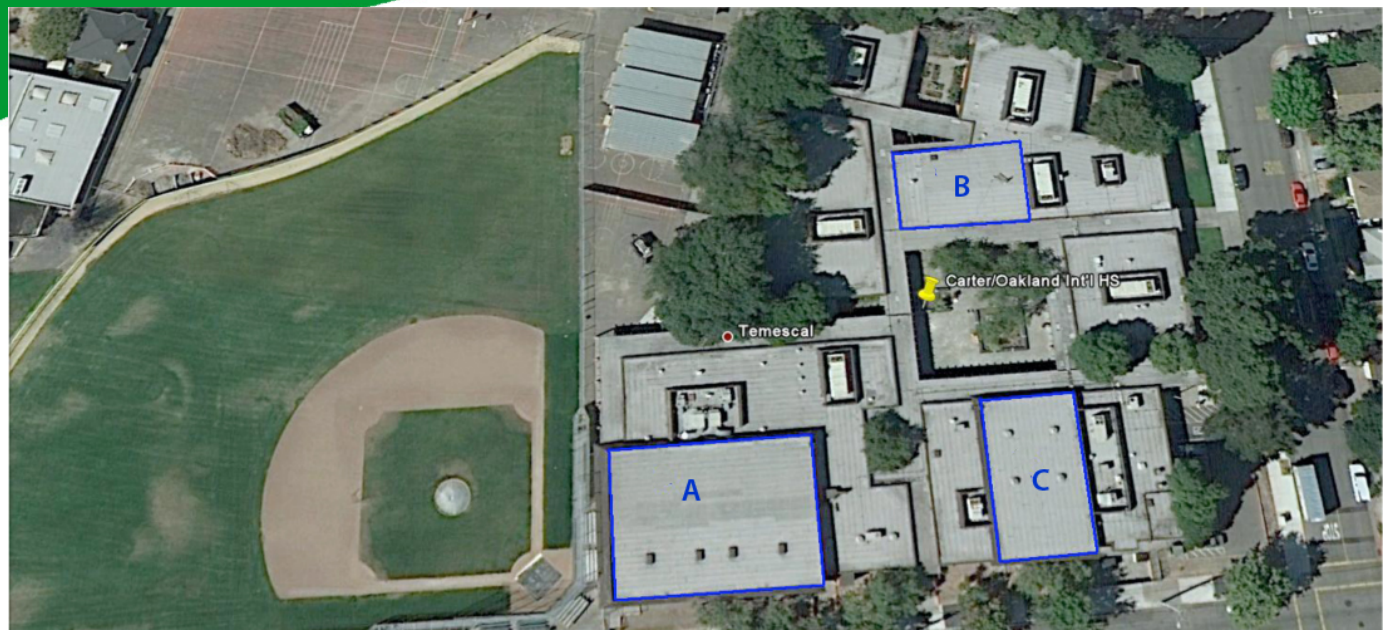
- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***minimal–moderate***

Greenhouse Gases Avoided Annually:
28 metric tons

Renewable Energy Credits Generated Annually:
110

Carter/Oakland International High School

4521 Webster Street



LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	7,200	90		90				
Roof B	2,856	40		40				
Roof C	3,600	40		40				
Totals	**13,656**	**170**	**0**	**170**	**$884,000**	**$157,915**	**229,500**	**38%**
System size and pricing to meet current electricity demand				*	*	*	*	*

*Estimated PV capacity is not enough to offset current electricity consumption

Annual Electricity Cost and Consumption
Cost: $90,968
Consumption: 599,419 kWh

Contextual Data

- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***clear–minimal***
- A system size of ~333 kWp would produce ~75% of the school's load.

Greenhouse Gases Avoided Annually:
58 metric tons

Renewable Energy Credits Generated Annually:
230

Castlemont High School

8601 MacArthur Boulevard

<PLEASE SEE NEXT PAGE FOR DETAILS>

Annual Electricity Cost and Consumption
Cost: $190,561
Consumption: 1,432,121 kWh

Contextual Data

- What are age & condition of roofs?
- Preliminary roof structural assessment by Interactive Resources (August 2011) concluded that "positively anchored solar (PV) arrays can be supported on the existing structures." A full report is included in the Solar Master Plan.
- Roof obstructions: ***clear–significant***

Greenhouse Gases Avoided Annually:
273 metric tons

Renewable Energy Credits Generated Annually:
1,074

Castlemont High School *continued*

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	18,060	120		120				
Roof B	21,000	140		140				
Roof C	13,620	20		20				
Roof D	2,450	10		10				
Roof E	8,400	70		70				
Roof F	7,920	30		30				
Roof G	5,124	60		60				
Roof H	7,480	100		100				
Parking 1	18,700	0	320	320				
Totals	**102,754**	**550**	**320**	**870**	**$4,418,000**	**$808,156**	**1,174,500**	**82%**
System size and pricing to meet current electricity demand				**796**	**$4,006,000**	**$739,065**	**1,074,091**	**75%**

Cesar Chavez Elementary

2825 International Boulevard

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	17,625	90		90				
Roof B	10,680	50		50				
Totals	**28,305**	**140**	**0**	**140**	**$728,000**	**$82,333**	**189,000**	**39%**
System size and pricing to meet current electricity demand				*	*	*	*	*

*Estimated PV capacity is not enough to offset current electricity consumption

Annual Electricity Cost and Consumption
Cost: $75,893
Consumption: 487,200 kWh

Contextual Data

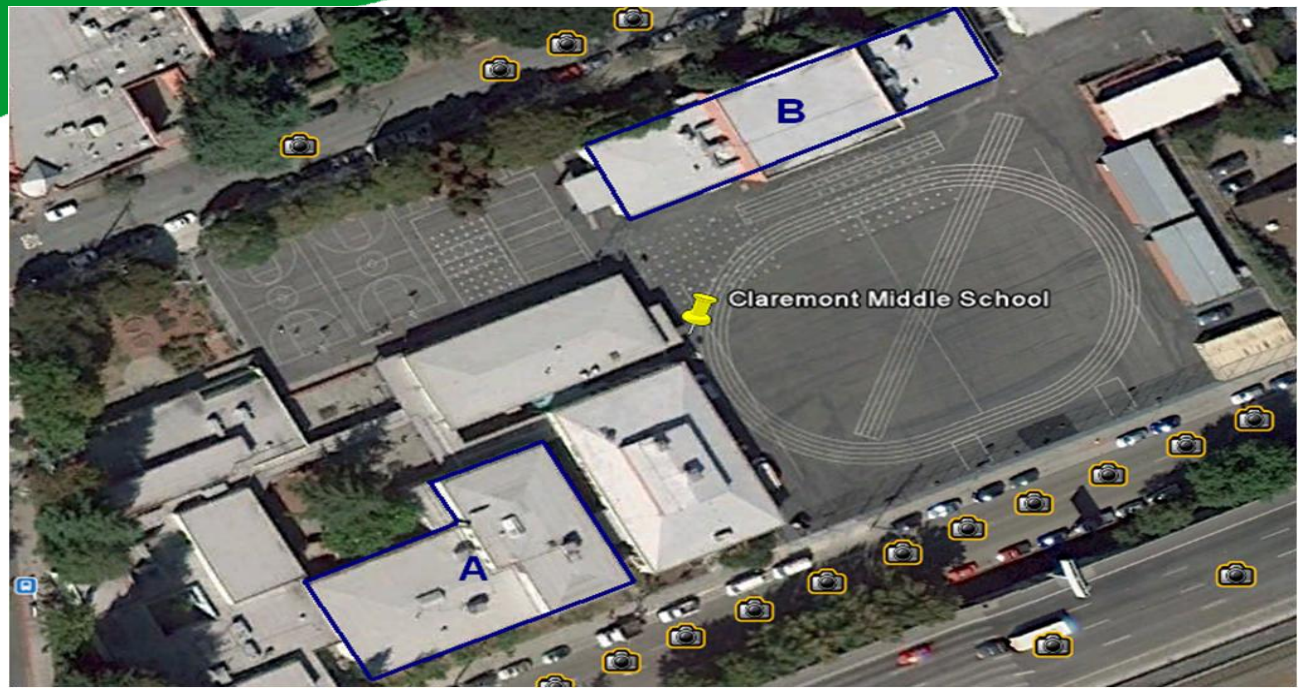
- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***significant***
- A system size of ~271 kWp would produce ~75% of the school's load.

Greenhouse Gases Avoided Annually:
48 metric tons

Renewable Energy Credits Generated Annually:
189

Claremont Middle School

5750 College Avenue



LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	10,000	70		70				
Roof B	8,325	70		70				
Totals	**18,325**	**140**	**0**	**140**	**$728,000**	**$130,048**	**189,000**	**64%**
System size and pricing to meet current electricity demand				*	*	*	*	*

*Estimated PV capacity is not enough to offset current electricity consumption

Annual Electricity Cost and Consumption
Cost: $47,795
Consumption: 294,960 kWh

Contextual Data

- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***moderate–significant***
- A system size of ~164 kWp would produce ~75% of the school's load.

Greenhouse Gases Avoided Annually:
48 metric tons

Renewable Energy Credits Generated Annually:
189

Cleveland Elementary

745 Cleveland Street

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	10,000	100		100				
Roof B	9,500	100		100				
Totals	**19,500**	**200**	**0**	**200**	**$1,040,000**	**$117,618**	**270,000**	**168%**
System size and pricing to meet current electricity demand				**90**	**$465,458**	**$52,641**	**120,840**	**75%**

Annual Electricity Cost and Consumption
Cost: $25,636
Consumption: 161,120 kWh

Contextual Data

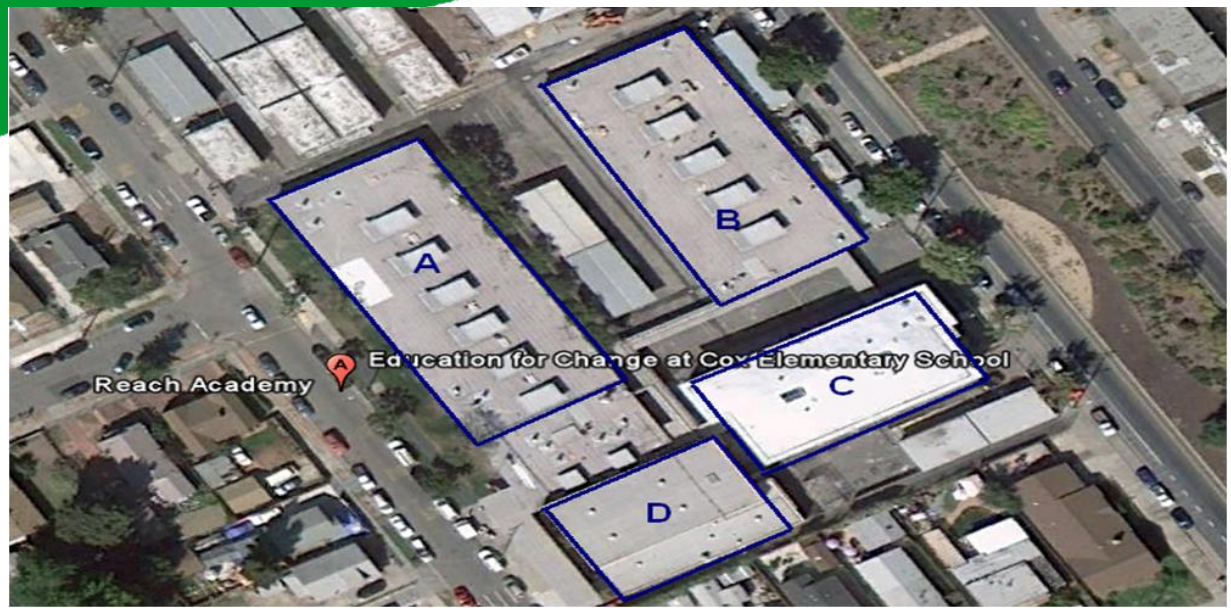
- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***minimal***

Greenhouse Gases Avoided Annually:
31 metric tons

Renewable Energy Credits Generated Annually:
121

Cox Elementary

9860 Sunnyside Street



LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	15,200	100		100				
Roof B	13,440	90		90				
Roof C	6,720	70		70				
Roof D	7,000	70		70				
Totals	**42,360**	**330**	**0**	**330**	**$1,617,000**	**$194,070**	**445,500**	**384%**
System size and pricing to meet current electricity demand				**64**	**$335,117**	**$37,900**	**87,002**	**75%**

Annual Electricity Cost and Consumption
Cost: $20,424
Consumption: 116,002 kWh

Contextual Data

- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***minimal–moderate***

Greenhouse Gases Avoided Annually:
22 metric tons

Renewable Energy Credits Generated Annually:
87

Crocker Elementary

525 Midcrest Road

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	12,750	130		130				
Roof B	5,876	60		60				
Totals	**18,626**	**190**	**0**	**190**	**$998,000**	**$111,737**	**256,500**	**196%**
System size and pricing to meet current electricity demand				**73**	**$378,329**	**$42,787**	**98,220**	**75%**

Annual Electricity Cost and Consumption
Cost: $25,471
Consumption: 130,960 kWh

Contextual Data

- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***minimal***

Greenhouse Gases Avoided Annually:
25 metric tons

Renewable Energy Credits Generated Annually:
98

Dewey Academy

1111 2nd Avenue

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	8,100	100		100				
Roof B	6,390	80		80				
Totals	**14,490**	**180**	**0**	**180**	**$936,000**	**$105,856**	**243,000**	**115%**
System size and pricing to meet current electricity demand				**117**	**$608,400**	**$68,806**	**157,950**	**75%**

Annual Electricity Cost and Consumption
Cost: $36,669
Consumption: 210,600 kWh

Contextual Data

- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***clear***

Greenhouse Gases Avoided Annually:
40 metric tons

Renewable Energy Credits Generated Annually:
158

Edna Brewer Middle School

3748 13th Avenue

<PLEASE SEE NEXT PAGE FOR DETAILS>

Annual Electricity Cost and Consumption
Cost: $65,460
Consumption: 378,560 kWh

Contextual Data

- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***minimal–significant***

Greenhouse Gases Avoided Annually:
72 metric tons

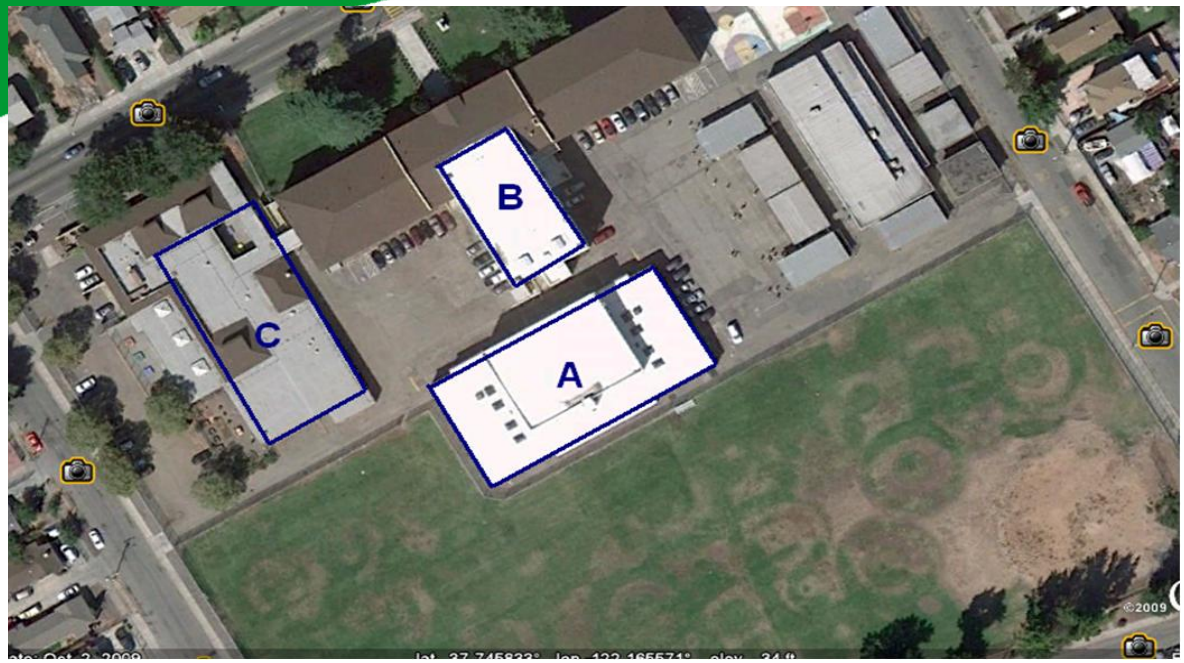
Renewable Energy Credits Generated Annually:
284

Edna Brewer Middle School *continued*

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	2,720	30		30				
Roof B	3,472	40		40				
Roof C	6,580	70		70				
Roof D	9,295	60		60				
Roof E	14,495	150		150				
Totals	**36,562**	**350**	**0**	**350**	**$1,715,000**	**$325,120**	**472,500**	**125%**
System size and pricing to meet current electricity demand				**210**	**$1,093,618**	**$195,361**	**283,920**	**75%**

Elmhurst Community Preparatory

1800 98th Avenue



LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	15,725	130		130				
Roof B	6,300	60		60				
Roof C	14,025	120		120				
Totals	**36,050**	**310**	**0**	**310**	**$1,519,000**	**$182,308**	**418,500**	**135%**
System size and pricing to meet current electricity demand				**172**	**$893,013**	**$100,995**	**231,840**	**75%**

Annual Electricity Cost and Consumption
Cost: $49,974
Consumption: 309,120 kWh

Contextual Data

- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***minimal–moderate***

Greenhouse Gases Avoided Annually:
59 metric tons

Renewable Energy Credits Generated Annually:
232

Emerson Elementary

385 49th Street

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	7,800	50		50				
Roof B	13,600	90		90				
Totals	**21,400**	**140**	**0**	**140**	**$728,000**	**$82,333**	**189,000**	**102%**
System size and pricing to meet current electricity demand				**103**	**$535,253**	**$60,534**	**138,960**	**75%**

Annual Electricity Cost and Consumption
Cost: $31,031
Consumption: 185,280 kWh

Contextual Data
- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***significant***

Greenhouse Gases Avoided Annually:
35 metric tons

Renewable Energy Credits Generated Annually:
139

Esperanza (Stonehurst Campus)

10315 E Street

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	5,525	50		50				
Roof B	8,500	90		90				
Roof C	5,000	50		50				
Totals	**19,025**	**190**	**0**	**190**	**$988,000**	**$111,737**	**256,500**	**68%**
System size and pricing to meet current electricity demand				*	*	*	*	*

*Estimated PV capacity is not enough to offset current electricity consumption

Annual Electricity Cost and Consumption
Cost: $65,032
Consumption: 376,840 kWh

Contextual Data

- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***minimal–moderate***
- A system size of ~209 kWp would produce ~75% of the school's load.

Greenhouse Gases Avoided Annually:
65 metric tons

Renewable Energy Credits Generated Annually:
257

Franklin Elementary

915 Foothill Boulevard

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	19,500	170		170				
Roof B	11,200	100		100				
Roof C	11,410	100		100				
Roof D	7,000	70		70				
Totals	**49,110**	**440**	**0**	**440**	**$2,156,000**	**$258,759**	**594,000**	**235%**
System size and pricing to meet current electricity demand				**141**	**$731,120**	**$82,685**	**189,810**	**75%**

Annual Electricity Cost and Consumption
Cost: $43,776
Consumption: 253,080 kWh

Contextual Data

- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***minimal–moderate***

Greenhouse Gases Avoided Annually:
48 metric tons

Renewable Energy Credits Generated Annually:
190

Fremont High School

4510 Foothill Boulevard

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	8,030	100		100				
Roof B	1,012	10		10				
Roof C	1,890	20		20				
Parking 1	9,025		150	150				
Totals	**19,957**	**130**	**150**	**280**	**$1,576,000**	**$260,096**	**378,000**	**26%**
System size and pricing to meet current electricity demand				*	*	*	*	*

*Estimated PV capacity is not enough to offset current electricity consumption

Annual Electricity Cost and Consumption
Cost: $204,444
Consumption: 1,431,888 kWh

Contextual Data

- What are age & condition of roofs?
- Preliminary roof structural assessment by Interactive Resources (September 2011) concluded that "positively anchored solar (PV) arrays can be supported on the existing structures." A full report is included in the Solar Master Plan.
- Roof obstructions: ***clear–moderate***
- A system size of ~795 kWp would produce ~ 75% of the school's load.

Greenhouse Gases Avoided Annually:
96 metric tons

Renewable Energy Credits Generated Annually:
378

Frick Middle School

2845 64th Avenue

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	24,850	210		210				
Roof B	18,050	150		150				
Roof C	20,140	100		100				
Roof D	6,020	80		80				
Totals	**69,060**	**540**	**0**	**540**	**$2,484,000**	**$317,568**	**729,000**	**191%**
System size and pricing to meet current electricity demand				**212**	**$1,099,858**	**$124,388**	**285,540**	**75%**

Annual Electricity Cost and Consumption
Cost: $56,813
Consumption: 380,720 kWh

Contextual Data

- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***clear–significant***

Greenhouse Gases Avoided Annually:
73 metric tons

Renewable Energy Credits Generated Annually:
286

Fruitvale Elementary

3200 Boston Avenue

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	12,220	100		100				
Roof B	9,500	80		80				
Totals	**21,720**	**180**	**0**	**180**	**$936,000**	**$105,856**	**243,000**	**121%**
System size and pricing to meet current electricity demand				**112**	**$582,053**	**$65,827**	**151,110**	**75%**

Annual Electricity Cost and Consumption
Cost: $32,515
Consumption: 201,480 kWh

Contextual Data

- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***moderate***

Greenhouse Gases Avoided Annually:
38 metric tons

Renewable Energy Credits Generated Annually:
151

Garfield Elementary

1640 22nd Avenue

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	15,189	100		100				
Roof B	15,400	100		100				
Roof C	9,040	120		120				
Totals	**39,629**	**320**	**0**	**320**	**$1,568,000**	**$188,189**	**432,000**	**133%**
System size and pricing to meet current electricity demand				**180**	**$936,000**	**$105,856**	**243,000**	**75%**

Annual Electricity Cost and Consumption
Cost: $51,459
Consumption: 324,000 kWh

Contextual Data

- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***clear–significant***

Greenhouse Gases Avoided Annually:
62 metric tons

Renewable Energy Credits Generated Annually:
243

Glenview Elementary

4215 La Cresta Avenue

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	14,000	120		120				
Totals	**14,000**	**120**	**0**	**120**	**$624,000**	**$70,571**	**162,000**	**127%**
System size and pricing to meet current electricity demand				**71**	**$369,893**	**$41,833**	**96,030**	**75%**

Annual Electricity Cost and Consumption
Cost: $21,938
Consumption: 128,040 kWh

Contextual Data
- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***moderate***

Greenhouse Gases Avoided Annually:
24 metric tons

Renewable Energy Credits Generated Annually:
96

Grass Valley Elementary

4720 Dunkirk Avenue

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	22,000	140		140				
Totals	**22,000**	**140**	**0**	**140**	**$728,000**	**$82,333**	**189,000**	**164%**
System size and pricing to meet current electricity demand				**64**	**$332,916**	**$37,651**	**86,430**	**75%**

Annual Electricity Cost and Consumption
Cost: $19,708
Consumption: 115,240 kWh

Contextual Data

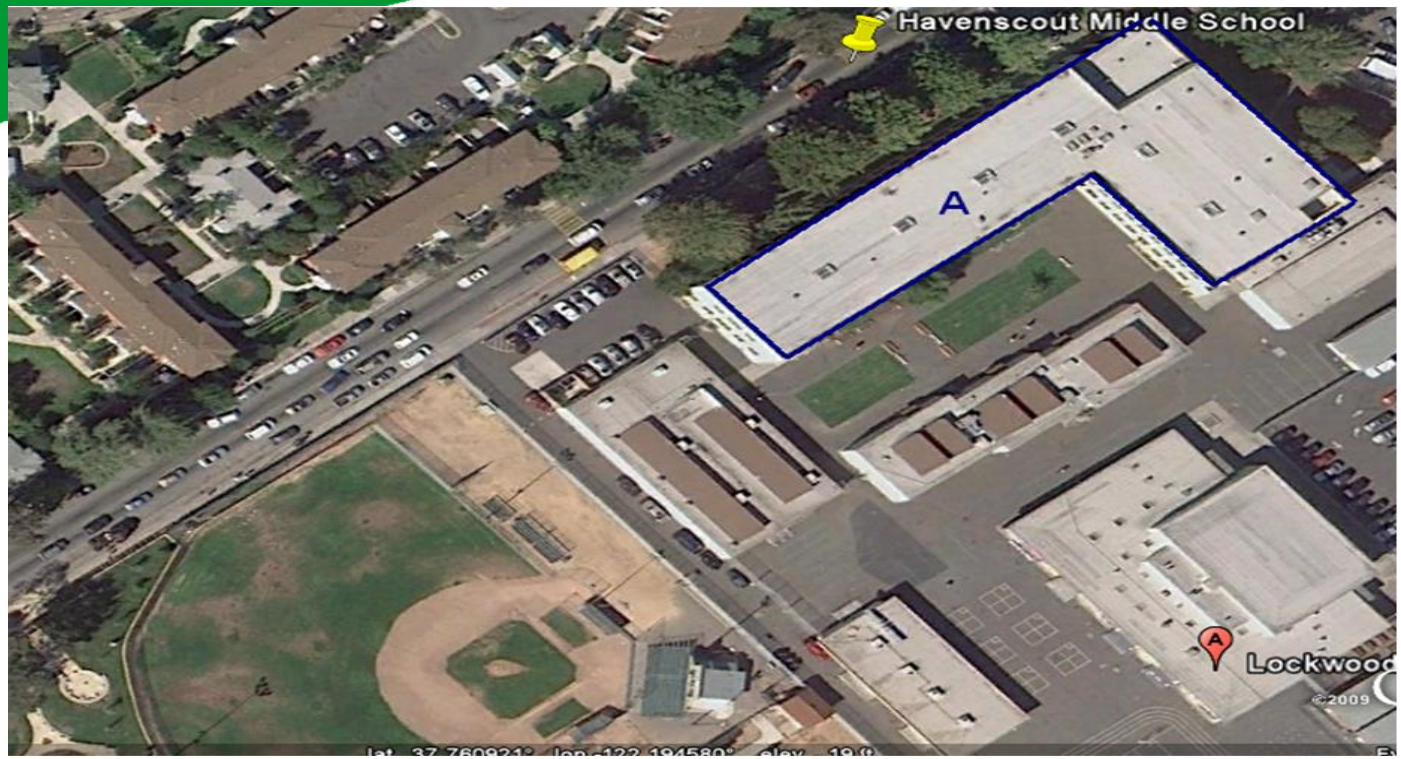
- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***significant***

Greenhouse Gases Avoided Annually:
22 metric tons

Renewable Energy Credits Generated Annually:
86

Havenscourt Middle School

1390 66th Avenue



LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	22,300	150		150				
Totals	**22,300**	**150**	**0**	**150**	**$780,000**	**$139,337**	**202,500**	**43%**
System size and pricing to meet current electricity demand				*	*	*	*	*

*Estimated PV capacity is not enough to offset current electricity consumption

Annual Electricity Cost and Consumption
Cost: $75,659
Consumption: 474,720 kWh

Contextual Data

- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***significant***
- A system size of ~264 kWp would produce ~75% of the school's load.

Greenhouse Gases Avoided Annually:
51 metric tons

Renewable Energy Credits Generated Annually:
203

Hillcrest Elementary

30 Marguerite Drive

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	4,900	60		60				
Roof B	7,000	90		90				
Roof C	3,600	50		50				
Totals	**15,500**	**200**	**0**	**200**	**$1,040,000**	**$117,618**	**270,000**	**270%**
System size and pricing to meet current electricity demand				**56**	**$288,889**	**$32,672**	**75,000**	**75%**

Annual Electricity Cost and Consumption
Cost: $16,582
Consumption: 100,000 kWh

Contextual Data

- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***clear***

Greenhouse Gases Avoided Annually:
19 metric tons

Renewable Energy Credits Generated Annually:
75

Hoover Elementary

890 Brockhurst Street

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	7,500	90		90				
Totals	**7,500**	**90**	**0**	**90**	**$468,000**	**$52,928**	**121,500**	**71%**
System size and pricing to meet current electricity demand				*	*	*	*	*

*Estimated PV capacity is not enough to offset current electricity consumption

Annual Electricity Cost and Consumption
Cost: $28,863
Consumption: 172,200 kWh

Contextual Data

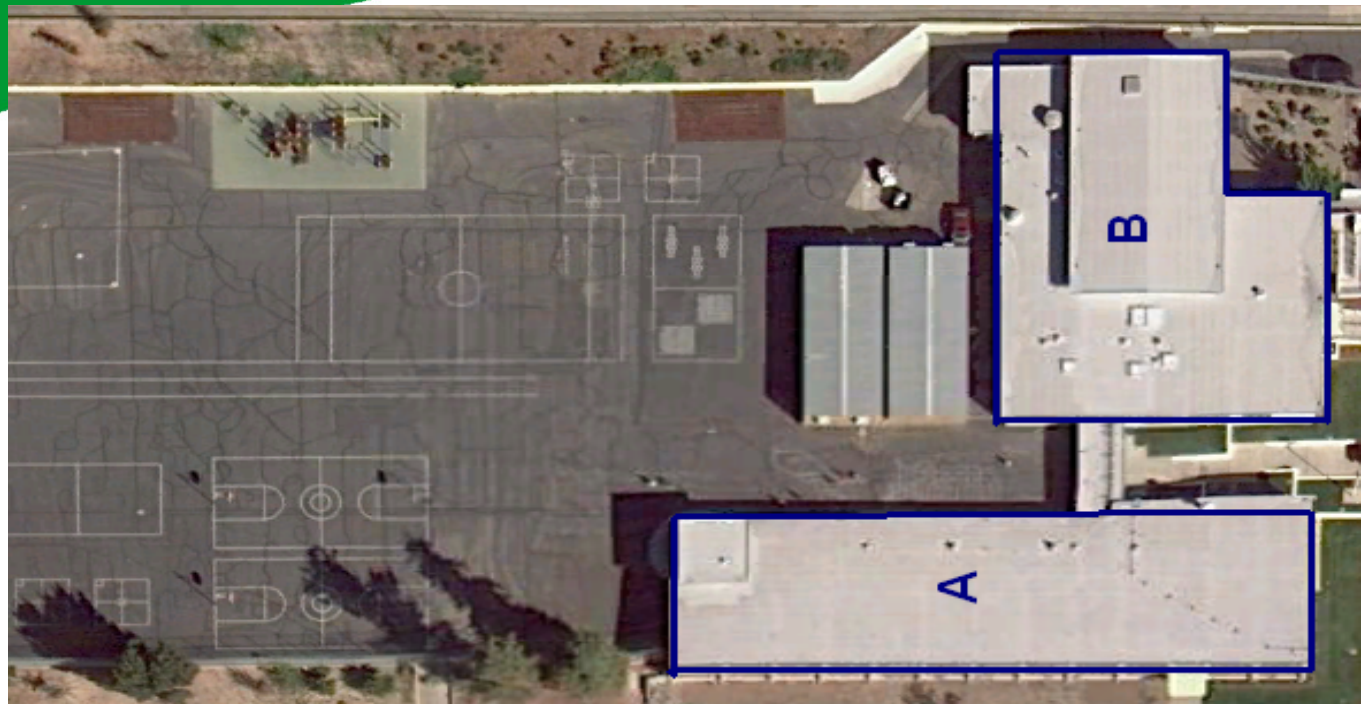
- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***clear***
- A system size of ~96 kWp would produce ~75% of the school's load.

Greenhouse Gases Avoided Annually:
31 metric tons

Renewable Energy Credits Generated Annually:
122

Horace Mann Elementary

5222 Ygnacio Avenue



LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	10,000	90		90				
Roof B	10,500	90		90				
Totals	**20,500**	**180**	**0**	**180**	**$936,000**	**$105,856**	**243,000**	**122%**
System size and pricing to meet current electricity demand				**111**	**$575,467**	**$65,082**	**149,400**	**75%**

Annual Electricity Cost and Consumption
Cost: $32,860
Consumption: 199,200 kWh

Contextual Data
- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***moderate***

Greenhouse Gases Avoided Annually:
38 metric tons

Renewable Energy Credits Generated Annually:
149

Howard Elementary

8755 Fontaine Street

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	14,820	190		190				
Roof B	14,060	180		180				
Roof C	13,320	140		140				
Totals	**42,200**	**510**	**0**	**510**	**$2,346,000**	**$299,926**	**688,500**	**484%**
System size and pricing to meet current electricity demand				**79**	**$410,916**	**$46,472**	**106,680**	**75%**

Annual Electricity Cost and Consumption
Cost: $25,845
Consumption: 142,240 kWh

Contextual Data

- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***clear–minimal***

Greenhouse Gases Avoided Annually:
27 metric tons

Renewable Energy Credits Generated Annually:
107

Jefferson Elementary

2035 40th Avenue

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	10,880	90		90				
Roof B	12,980	110		110				
Totals	**23,860**	**200**	**0**	**200**	**$1,040,000**	**$117,618**	**270,000**	**83%**
System size and pricing to meet current electricity demand				**182**	**$943,858**	**$106,745**	**245,040**	**75%**

Annual Electricity Cost and Consumption
Cost: $55,817
Consumption: 326,720 kWh

Contextual Data

- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***moderate***

Greenhouse Gases Avoided Annually:
62 metric tons

Renewable Energy Credits Generated Annually:
245

Joaquin Miller Elementary

5525 Ascot Drive

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	21,500	150		150				
Totals	**21,500**	**150**	**0**	**150**	**$780,000**	**$88,213**	**202,500**	**141%**
System size and pricing to meet current electricity demand				**80**	**$415,076**	**$46,943**	**107,760**	**75%**

Annual Electricity Cost and Consumption
Cost: $24,368
Consumption: 143,680 kWh

Contextual Data
- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***significant***

Greenhouse Gases Avoided Annually:
27 metric tons

Renewable Energy Credits Generated Annually:
108

Kaiser Elementary

5 South Hill Court

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	15,990	100		100				
Totals	**15,990**	**100**	**0**	**100**	**$520,000**	**$58,809**	**135,000**	**175%**
System size and pricing to meet current electricity demand				**43**	**$223,022**	**$25,223**	**57,900**	**75%**

Annual Electricity Cost and Consumption
Cost: $13,262
Consumption: 77,200 kWh

Contextual Data
- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***significant***

Greenhouse Gases Avoided Annually:
15 metric tons

Renewable Energy Credits Generated Annually:
58

King Estate Middle School

8251 Fontaine Street

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	16,400	110		110				
Roof B	16,400	110		110				
Roof C	10,000	70		70				
Roof D	12,325	120		120				
Totals	**55,125**	**410**	**0**	**410**	**$2,009,000**	**$380,855**	**553,500**	**177%**
System size and pricing to meet current electricity demand				**174**	**$904,800**	**$161,631**	**234,900**	**75%**

Annual Electricity Cost and Consumption
Cost: $47,415
Consumption: 313,200 kWh

Contextual Data
- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***moderate–significant***

Greenhouse Gases Avoided Annually:
60 metric tons

Renewable Energy Credits Generated Annually:
235

Lafayette Elementary

1700 Market Street

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	30,000	200		200				
Totals	**30,000**	**200**	**0**	**200**	**$1,040,000**	**$117,618**	**270,000**	**176%**
System size and pricing to meet current electricity demand				**85**	**$443,733**	**$50,184**	**115,200**	**75%**

Annual Electricity Cost and Consumption
Cost: $25,802
Consumption: 153,600 kWh

Contextual Data

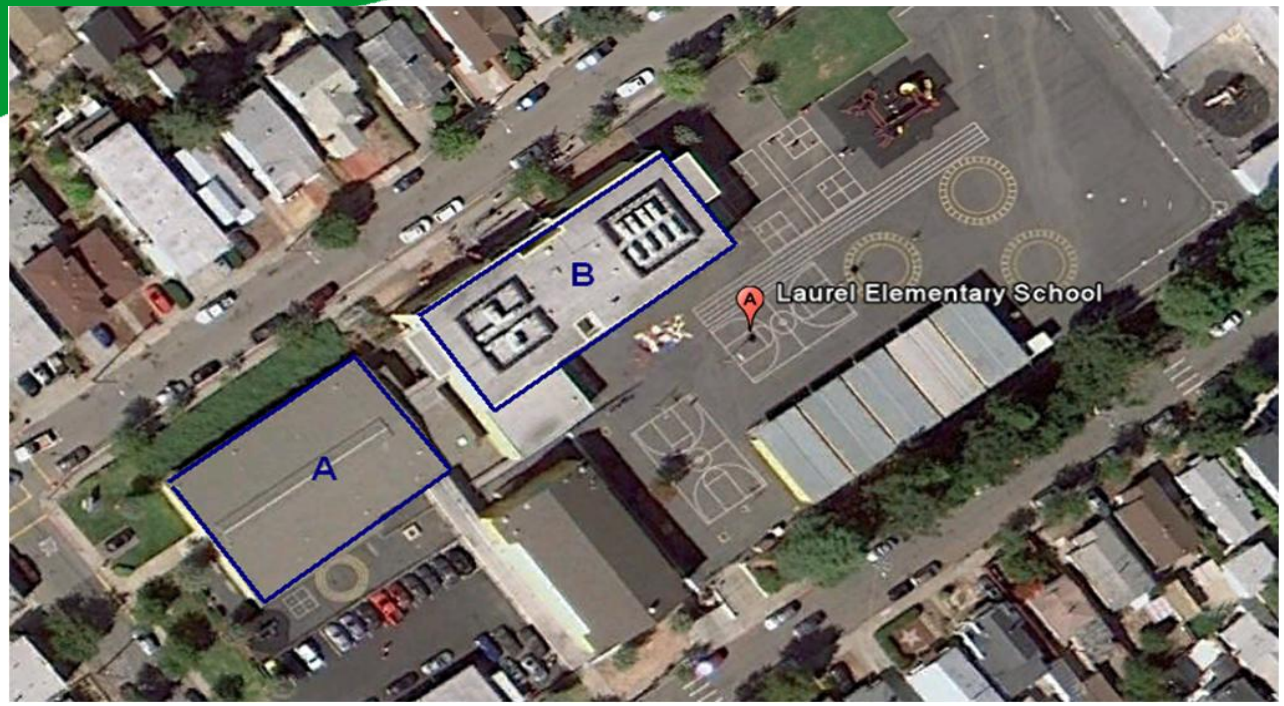
- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***significant***

Greenhouse Gases Avoided Annually:
29 metric tons

Renewable Energy Credits Generated Annually:
115

Laurel Elementary

3750 Brown Avenue



LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	9,200	90		90				
Roof B	8,520	40		40				
Totals	**17,720**	**130**	**0**	**130**	**$676,000**	**$76,452**	**175,500**	**105%**
System size and pricing to meet current electricity demand				**93**	**$481,867**	**$54,496**	**125,100**	**75%**

Annual Electricity Cost and Consumption
Cost: $27,853
Consumption: 166,800 kWh

Contextual Data
- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***moderate–significant***

Greenhouse Gases Avoided Annually:
32 metric tons

Renewable Energy Credits Generated Annually:
125

Life Academy High School

2111 Internnational Boulevard

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	11,890	60		60				
Roof B	3,800	20		20				
Totals	**15,690**	**80**	**0**	**80**	**$416,000**	**$47,047**	**108,000**	**42%**
System size and pricing to meet current electricity demand				*	*	*	*	*

*Estimated PV capacity is not enough to offset current electricity consumption

Annual Electricity Cost and Consumption
Cost: $42,035
Consumption: 256,320 kWh

Contextual Data

- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***significant***
- A system size of ~142 kWp would produce ~75% of the school's load.

Greenhouse Gases Avoided Annually:
27 metric tons

Renewable Energy Credits Generated Annually:
108

Lincoln Elementary

200 10th Street

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	13,320	170		170				
Roof B	8,750	70		70				
Totals	**22,070**	**240**	**0**	**240**	**$1,248,000**	**$141,142**	**324,000**	**258%**
System size and pricing to meet current electricity demand				**70**	**$363,422**	**$41,101**	**94,350**	**75%**

Annual Electricity Cost and Consumption
Cost: $21,141
Consumption: 125,800 kWh

Contextual Data

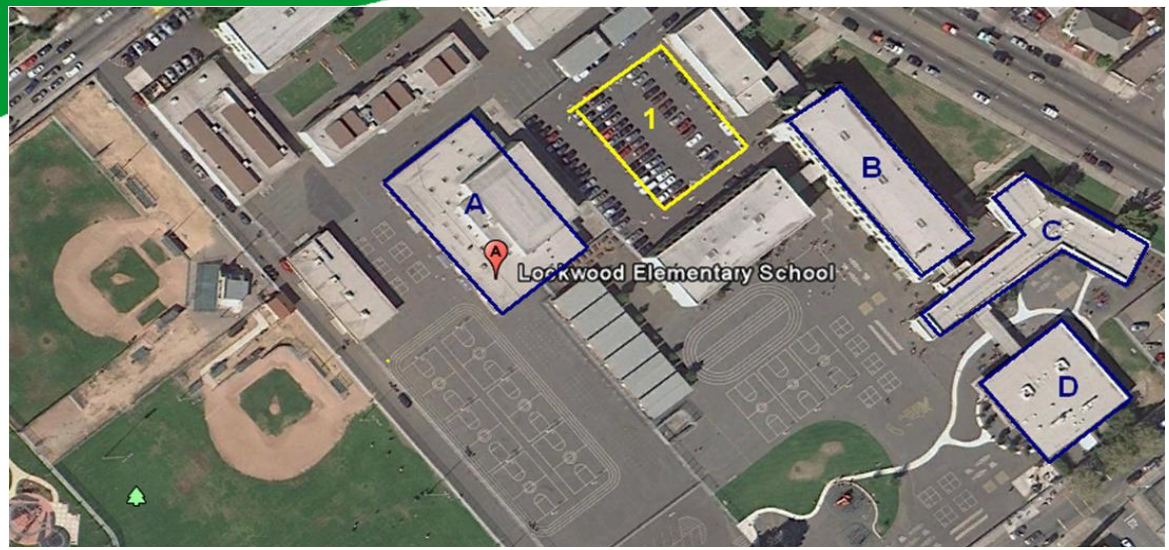
- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***clear–moderate***

Greenhouse Gases Avoided Annually:
24 metric tons

Renewable Energy Credits Generated Annually:
94

Lockwood Elementary

6701 International Boulevard



LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	8,400	40		40				
Roof B	11,484	80		80				
Roof C	7,600	40		40				
Roof D	9,500	50		50				
Parking	13,650		230	230				
Totals	**50,634**	**210**	**230**	**440**	**$2,472,000**	**$258,759**	**594,000**	**253%**
System size and pricing to meet current electricity demand				**130**	**$677,618**	**$76,635**	**175,920**	**75%**

Annual Electricity Cost and Consumption
Cost: $45,340
Consumption: 234,560 kWh

Contextual Data

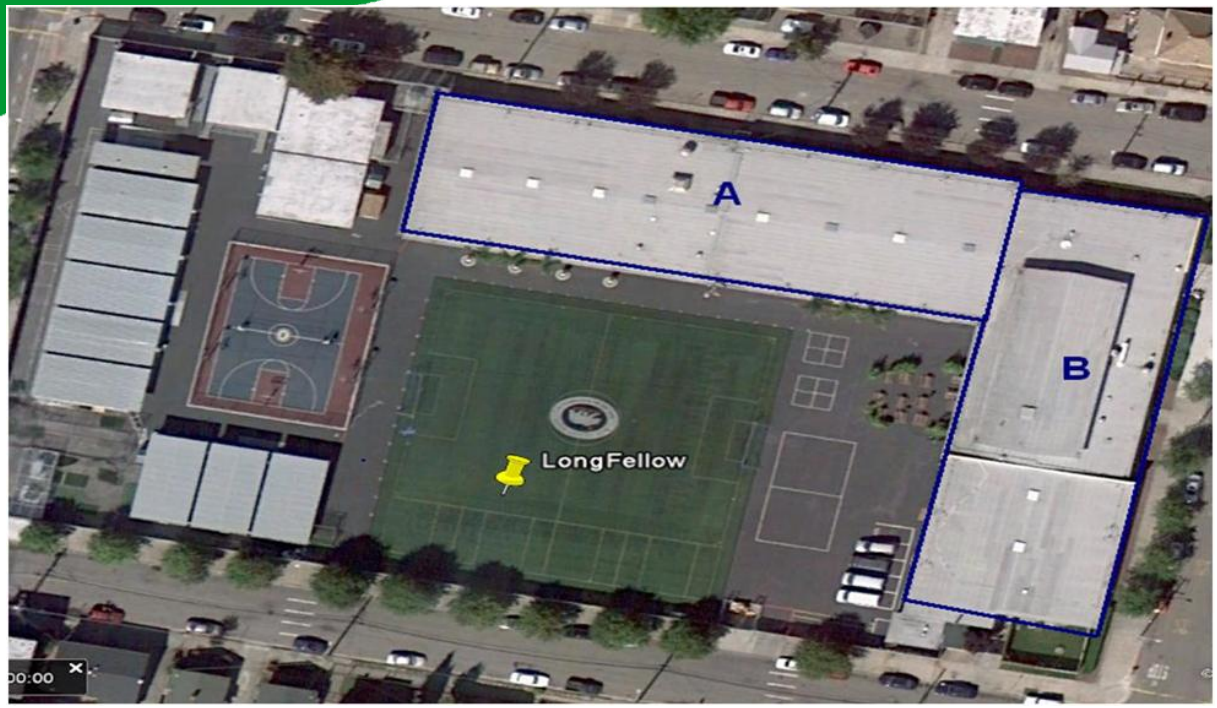
- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***significant***

Greenhouse Gases Avoided Annually:
45 metric tons

Renewable Energy Credits Generated Annually:
176

Longfellow Elementary

3877 Lusk Street



LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	18,375	160		160				
Roof B	16,498	110		110				
Totals	**34,873**	**270**	**0**	**270**	**$1,323,000**	**$158,784**	**364,500**	**177%**
System size and pricing to meet current electricity demand				**114**	**$594,418**	**$67,225**	**154,320**	**75%**

Annual Electricity Cost and Consumption
Cost: $32,634
Consumption: 205,760 kWh

Contextual Data

- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***significant***

Greenhouse Gases Avoided Annually:
39 metric tons

Renewable Energy Credits Generated Annually:
154

Lowell Middle School

1330 Filbert Street

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	10,400	70		70				
Roof B	10,400	70		70				
Roof C	26,500	140		140				
Roof D	6,525	30		30				
Totals	**53,825**	**310**	**0**	**310**	**$1,519,000**	**$287,963**	**418,500**	**115%**
System size and pricing to meet current electricity demand				**203**	**$1,053,318**	**$188,162**	**273,458**	**75%**

Annual Electricity Cost and Consumption
Cost: $54,151
Consumption: 364,610 kWh

Contextual Data

- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***significant***

Greenhouse Gases Avoided Annually:
69 metric tons

Renewable Energy Credits Generated Annually:
273

Madison Middle School

400 Capistrano Drive

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	51,800	350		350				
Roof B	14,875	80		80				
Roof C	7,770	50		50				
Totals	**74,445**	**480**	**0**	**480**	**$2,352,000**	**$282,283**	**648,000**	**199%**
System size and pricing to meet current electricity demand				**181**	**$942,240**	**$106,562**	**244,620**	**75%**

Annual Electricity Cost and aConsumption
Cost: $50,308
Consumption: 326,160 kWh

Contextual Data
- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***significant***

Greenhouse Gases Avoided Annually:
62 metric tons

Renewable Energy Credits Generated Annually:
245

Manzanita Community School/Seed School

2409 East 27th Street

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	19,000	130		130				
Roof B	18,270	90		90				
Roof C	11,625	80		80				
Totals	**48,895**	**300**	**0**	**300**	**$1,470,000**	**$176,427**	**405,000**	**122%**
System size and pricing to meet current electricity demand				**184**	**$959,111**	**$108,470**	**249,000**	**75%**

Annual Electricity Cost and Consumption
Cost: $51,893
Consumption: 332,000 kWh

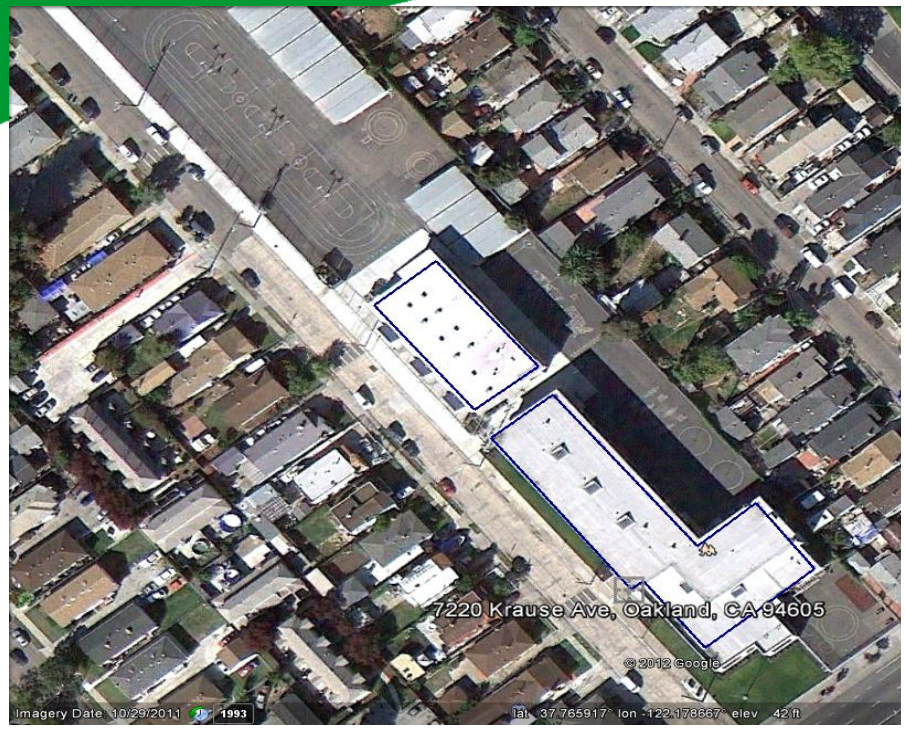
Contextual Data
- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***significant***

Greenhouse Gases Avoided Annually:
63 metric tons

Renewable Energy Credits Generated Annually:
249

Markham Elementary School

7220 Krause Avenue



LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	6,840	60		60				
Roof B	17,570	150		150				
Totals	**24,410**	**210**		**210**	**$1,092,000**	**$123,499**	**283,500**	**164%**
System size and pricing to meet current electricity demand				**96**	**$499,200**	**$56,457**	**129,600**	**75%**

Annual Electricity Cost and Consumption
Cost: $30,967
Consumption: 172,800 kWh

Contextual Data
- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***moderate***

Greenhouse Gases Avoided Annually:
33 metric tons

Renewable Energy Credits Generated Annually:
130

Marshall Elementary

3400 Malcolm Avenue

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	9,200	60		60				
Roof B	8,520	60		60				
Totals	**17,720**	**120**	**0**	**120**	**$624,000**	**$70,571**	**162,000**	**97%**
System size and pricing to meet current electricity demand				**93**	**$483,253**	**$54,653**	**125,460**	**75%**

Annual Electricity Cost and Consumption
Cost: $28,853
Consumption: 167,280 kWh

Contextual Data
- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***significant***

Greenhouse Gases Avoided Annually:
32 metric tons

Renewable Energy Credits Generated Annually:
125

McClymonds High School

2607 Myrtle Street

<PLEASE SEE NEXT PAGE FOR DETAILS>

Annual Electricity Cost and Consumption
Cost: $90,666
Consumption: 607,265 kWh

Contextual Data

- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***clear–significant***

Greenhouse Gases Avoided Annually:
116 metric tons

Renewable Energy Credits Generated Annually:
455

McClymonds High School *continued*

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	6,900	80		80				
Roof B	9,200	80		80				
Roof C	3,002	20		20				
Roof D	13,600	140		140				
Roof E	3,500	20		20				
Roof F	4,800	40		40				
Parking	6,475		110	110				
Totals	**47,477**	**380**	**110**	**490**	**$2,522,000**	**$455,168**	**661,500**	**109%**
System size and pricing to meet current electricity demand				**337**	**$1,653,110**	**$313,387**	**455,449**	**75%**

Melrose Elementary

314 East 10th Street

<PLEASE SEE NEXT PAGE FOR DETAILS>

Annual Electricity Cost and Consumption
Cost: $29,137
Consumption: 169,920 kWh

Contextual Data

- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***minimal–significant***

Greenhouse Gases Avoided Annually:
32 metric tons

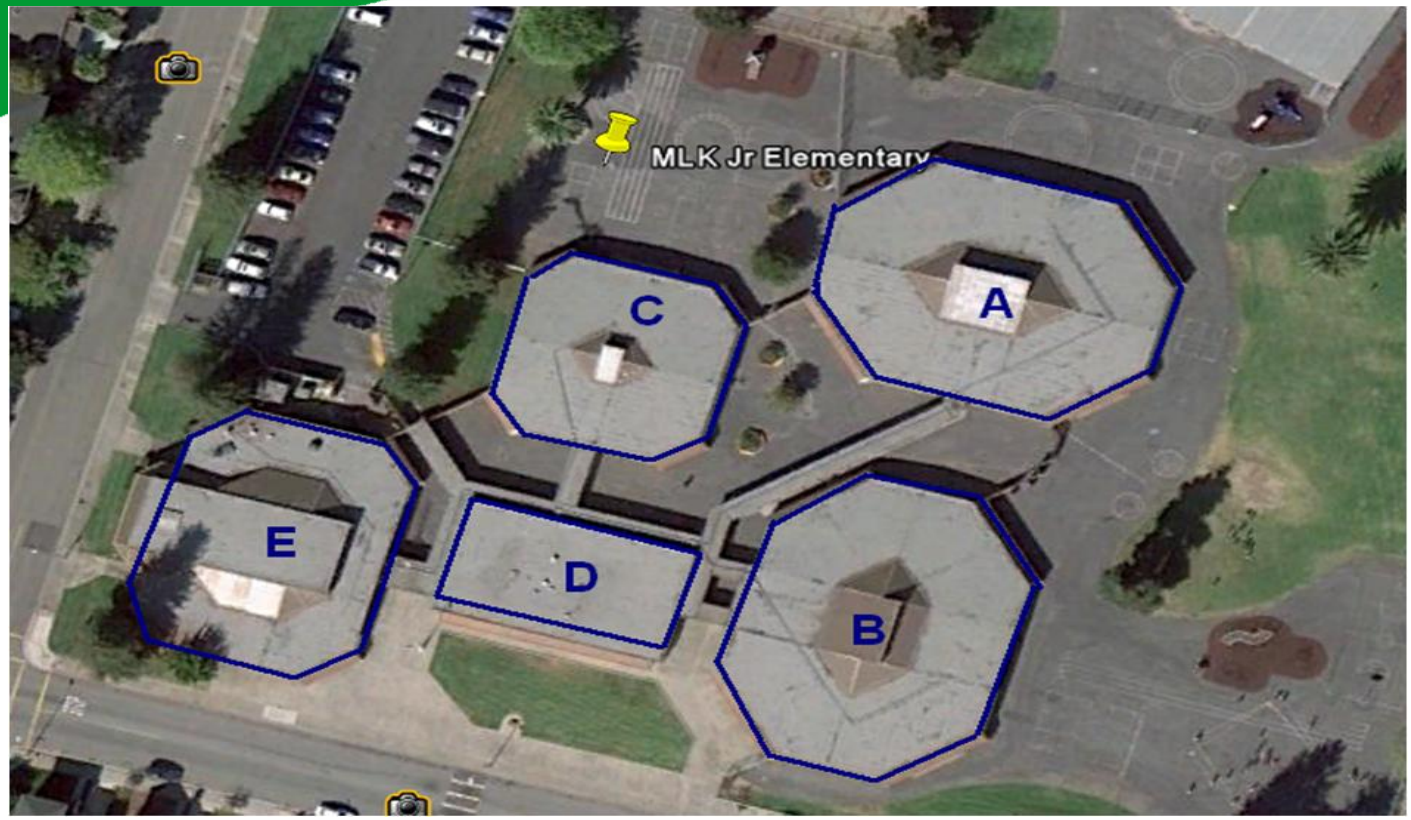
Renewable Energy Credits Generated Annually:
127

Melrose Elementary *continued*

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	5,564	30		30				
Roof B	8,250	100		100				
Roof C	1,026	10		10				
Roof D	1,955	20		20				
Totals	**16,795**	**160**	**0**	**160**	**$832,000**	**$94,094**	**216,000**	**127%**
System size and pricing to meet current electricity demand				**94**	**$490,880**	**$55,516**	**127,440**	**75%**

MLK Jr. Elementary

10th & Filbert Streets



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Annual Electricity Cost and Consumption
Cost: $60,963
Consumption: 361,920 kWh

Contextual Data

- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***minimal***

Greenhouse Gases Avoided Annually:
69 metric tons

Renewable Energy Credits Generated Annually:
271

MLK Jr. Elementary *continued*

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	12,432	130		130				
Roof B	12,432	130		130				
Roof C	6,705	70		70				
Roof D	4,500	50		50				
Roof E	10,000	100		100				
Totals	**46,068**	**480**	**0**	**480**	**$2,352,000**	**$282,283**	**648,000**	**179%**
System size and pricing to meet current electricity demand				**201**	**$1,045,547**	**$118,245**	**271,440**	**75%**

Montclair Elementary

1757 Mountain Boulevard

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	20,000	170		170				
Totals	**20,000**	**170**	**0**	**170**	**$884,000**	**$99,975**	**229,500**	**121%**
System size and pricing to meet current electricity demand				**105**	**$548,473**	**$62,029**	**142,392**	**75%**

Annual Electricity Cost and Consumption
Cost: $34,667
Consumption: 189,856 kWh

Contextual Data

- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***minimal–significant***

Greenhouse Gases Avoided Annually:
36 metric tons

Renewable Energy Credits
142

Montera Middle School

5555 Ascot Drive

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	11,200	70		70				
Roof B	25,500	150		150				
Roof C	9,600	70		70				
Totals	**46,300**	**290**	**0**	**290**	**$1,421,000**	**$269,385**	**391,500**	**91%**
System size and pricing to meet current electricity demand				**238**	**$1,237,233**	**$221,016**	**321,205**	**75%**

Annual Electricity Cost and Consumption
Cost: $67,556
Consumption: 428,273 kWh

Contextual Data
- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***significant***

Greenhouse Gases Avoided Annually:
82 metric tons

Renewable Energy Credits Generated Annually:
321

New Highland Academy

8521 A Street

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	13,300	100		100				
Roof B	10,500	50		50				
Totals	**23,800**	**150**	**0**	**150**	**$780,000**	**$88,213**	**202,500**	**56%**
System size and pricing to meet current electricity demand				*	*	*	*	*

*Estimated PV capacity is not enough to offset current electricity consumption

Annual Electricity Cost and Consumption
Cost: $58,731
Consumption: 360,320 kWh

Contextual Data

- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***moderate–significant***
- A system size of ~200 kWp would produce ~75% of the school's load.

Greenhouse Gases Avoided Annually:
51 metric tons

Renewable Energy Credits Generated Annually:
203

Oakland High School

1023 MacArthur Boulevard

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	5,840	60		60				
Roof B	49,220	130		130				
Roof C	8,550	90		90				
Roof D	10,050	60		60				
Totals	**73,660**	**340**	**0**	**340**	**$1,666,000**	**$315,831**	**459,000**	**27%**
System size and pricing to meet current electricity demand				*	*	*	*	*

*Estimated PV capacity is not enough to offset current electricity consumption

Annual Electricity Cost and Consumption
Cost: $248,983
Consumption: 1,706,498 kWh

Contextual Data

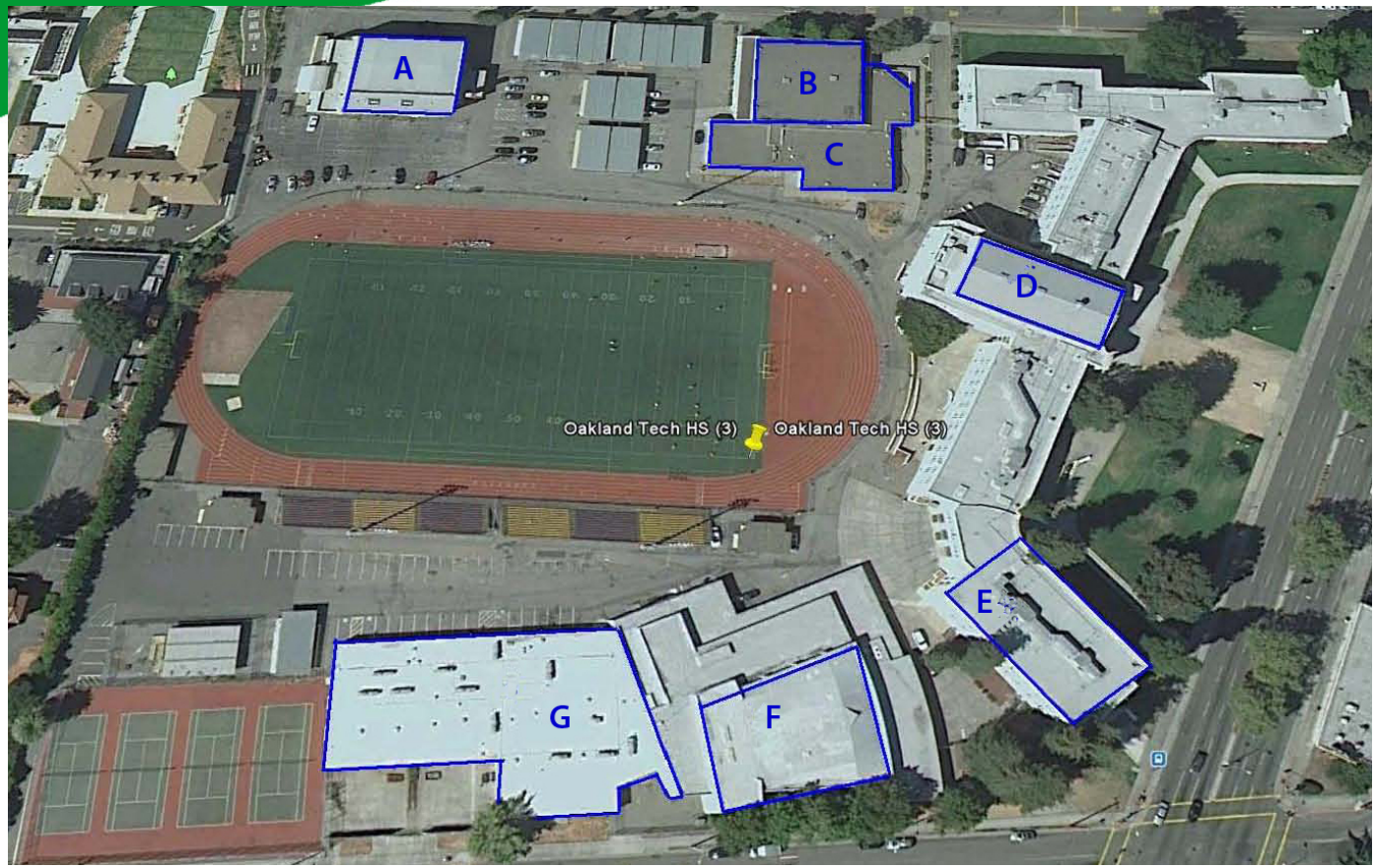
- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***minimal–significant***
- A system size of ~948 kWp would produce ~ 75% of the school's load.

Greenhouse Gases Avoided Annually:
117 metric tons

Renewable Energy Credits Generated Annually:
459

Oakland Tech

4351 Broadway



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Annual Electricity Cost and Consumption
Cost: $192,553
Consumption: 1,261,568 kWh

Contextual Data

- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***clear–significant***
- A system size of ~701 kWp would produce ~75% of the school's load.

Greenhouse Gases Avoided Annually:
202 metric tons

Renewable Energy Credits Generated Annually:
797

Oakland Tech *continued*

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	7,380	90		90				
Roof B	8,280	90		90				
Roof C	8,816	70		70				
Roof D	5,750	60		60				
Roof E	8,125	80		80				
Roof F	8,855	100		100				
Roof G	16,575	100		100				
Totals	**63,781**	**590**	**0**	**590**	**$2,714,000**	**$548,060**	**796,500**	**63%**
System size and pricing to meet current electricity demand				*	*	*	*	*

*Estimated PV capacity is not enough to offset current electricity consumption

Parker Elementary

7929 Ney Avenue

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	18,000	150		150				
Totals	**18,000**	**150**	**0**	**150**	**$780,000**	**$88,213**	**202,500**	**126%**
System size and pricing to meet current electricity demand				**89**	**$464,996**	**$52,588**	**120,720**	**75%**

Annual Electricity Cost and Consumption
Cost: $25,680
Consumption: 160,960 kWh

Contextual Data

- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***moderate***

Greenhouse Gases Avoided Annually:
31 metric tons

Renewable Energy Credits Generated Annually:
121

Piedmont Elementary

4314 Piedmont Avenue

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	15,900	110		110				
Roof B	7,475	30		30				
Totals	**23,375**	**140**	**0**	**140**	**$728,000**	**$82,333**	**189,000**	**113%**
System size and pricing to meet current electricity demand				**93**	**$483,947**	**$54,732**	**125,640**	**75%**

Annual Electricity Cost and Consumption
Cost: $27,251
Consumption: 167,520 kWh

Contextual Data

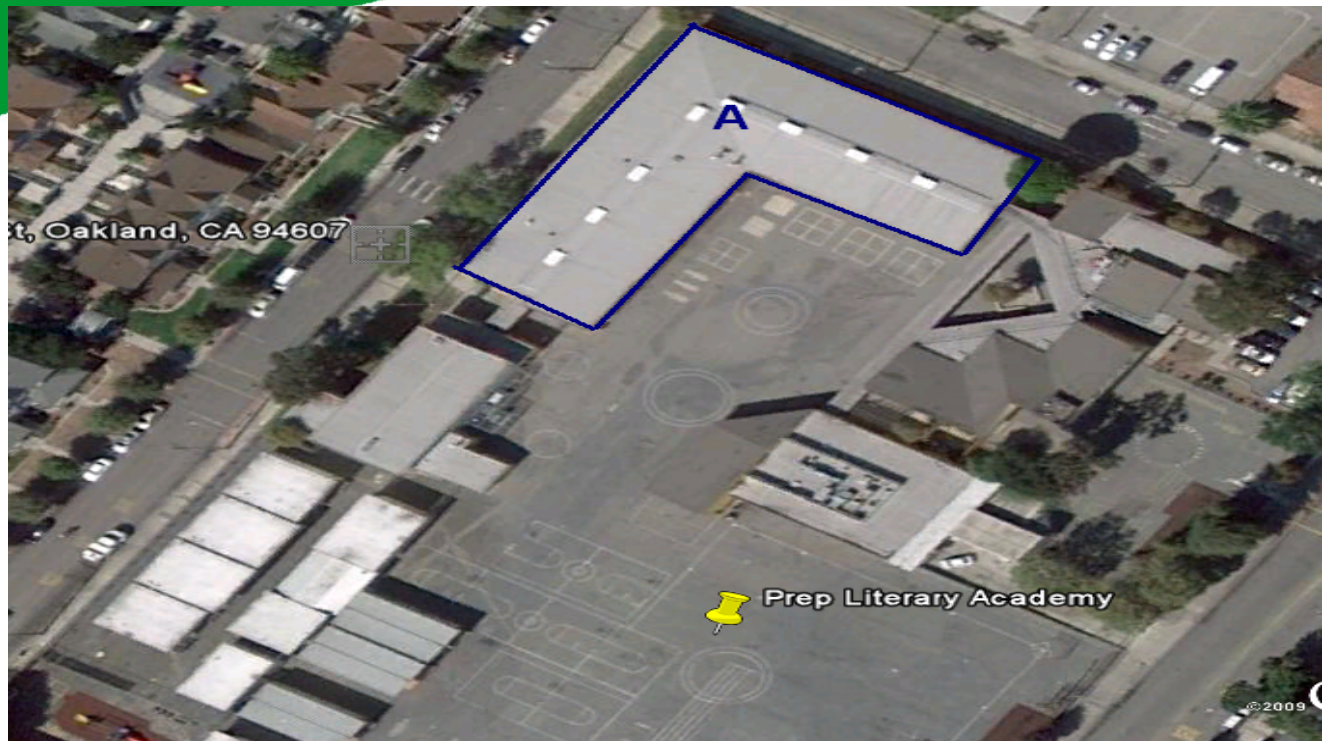
- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***significant***

Greenhouse Gases Avoided Annually:
32 metric tons

Renewable Energy Credits Generated Annually:
126

Prescott/Prep Literary Academy

920 Campbell Street



LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	20,300	210		210				
Totals	**20,300**	**210**	**0**	**210**	**$1,092,000**	**$123,499**	**283,500**	**87%**
System size and pricing to meet current electricity demand				**181**	**$941,547**	**$106,483**	**244,440**	**75%**

Annual Electricity Cost and Consumption
Cost: $50,877
Consumption: 325,920 kWh

Contextual Data

- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***minimal***

Greenhouse Gases Avoided Annually:
62 metric tons

Renewable Energy Credits Generated Annually:
244

Roosevelt Middle School

1926 19th Avenue

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	48,125	250		250				
Roof B	11,935	60		60				
Roof C	13,596	70		70				
Totals	**73,656**	**380**	**0**	**380**	**$1,862,000**	**$352,987**	**513,000**	**101%**
System size and pricing to meet current electricity demand				**282**	**$1,382,453**	**$262,078**	**380,880**	**75%**

Annual Electricity Cost and Consumption
Cost: $87,400
Consumption: 507,840 kWh

Contextual Data

- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***significant***

Greenhouse Gases Avoided Annually:
97 metric tons

Renewable Energy Credits Generated Annually:
381

Rusdale Continuation School

1180 70th Avenue

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	7,500	100		100				
Roof B	7,500	100		100				
Totals	**15,000**	**200**	**0**	**200**	**$1,040,000**	**$117,618**	**270,000**	**286%**
System size and pricing to meet current electricity demand				**53**	**$273,173**	**$30,894**	**70,920**	**75%**

Annual Electricity Cost and Consumption
Cost: $18,550
Consumption: 94,560 kWh

Contextual Data

- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***clear***

Greenhouse Gases Avoided Annually:
18 metric tons

Renewable Energy Credits Generated Annually:
71

Santa Fe Elementary

915 54th Street

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	11,275	120		120				
Roof B	6,700	70		70				
Totals	**17,975**	**190**	**0**	**190**	**$988,000**	**$176,494**	**256,500**	**167%**
System size and pricing to meet current electricity demand				**86**	**$444,658**	**$79,433**	**115,440**	**75%**

Annual Electricity Cost and Consumption
Cost: $25,487
Consumption: 153,920 kWh

Contextual Data

- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***minimal***

Greenhouse Gases Avoided Annually:
29 metric tons

Renewable Energy Credits Generated Annually:
115

Sequoia Elementary

3730 Lincoln Avenue

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	7,670	50		50				
Roof B	12,625	80		80				
Totals	**20,295**	**130**	**0**	**130**	**$676,000**	**$76,452**	**175,500**	**111%**
System size and pricing to meet current electricity demand				**88**	**$457,138**	**$51,700**	**118,680**	**75%**

Annual Electricity Cost and Consumption
Cost: $26,539
Consumption: 158,240 kWh

Contextual Data

- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***significant***

Greenhouse Gases Avoided Annually:
30 metric tons

Renewable Energy Credits Generated Annually:
119

Sherman

5308 Brann Street

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	17,000	130		130				
Totals	**17,000**	**130**	**0**	**130**	**$676,000**	**$76,452**	**175,500**	**165%**
System size and pricing to meet current electricity demand				**59**	**$308,071**	**$34,841**	**79,980**	**75%**

Annual Electricity Cost and Consumption
Cost: $18,228
Consumption: 106,640 kWh

Contextual Data

- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***moderate–significant***

Greenhouse Gases Avoided Annually:
20 metric tons

Renewable Energy Credits Generated Annually:
80

Simmons Middle School

2101 35th Avenue

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	20,400	140		140				
Roof B	3,850	30		30				
Roof C	3,784	30		30				
Totals	**28,034**	**200**	**0**	**200**	**$1,040,000**	**$117,618**	**270,000**	**57%**
System size and pricing to meet current electricity demand				*	*	*	*	*

*Estimated PV capacity is not enough to offset current electricity consumption

Annual Electricity Cost and Consumption
Cost: $68,861
Consumption: 471,360 kWh

Contextual Data

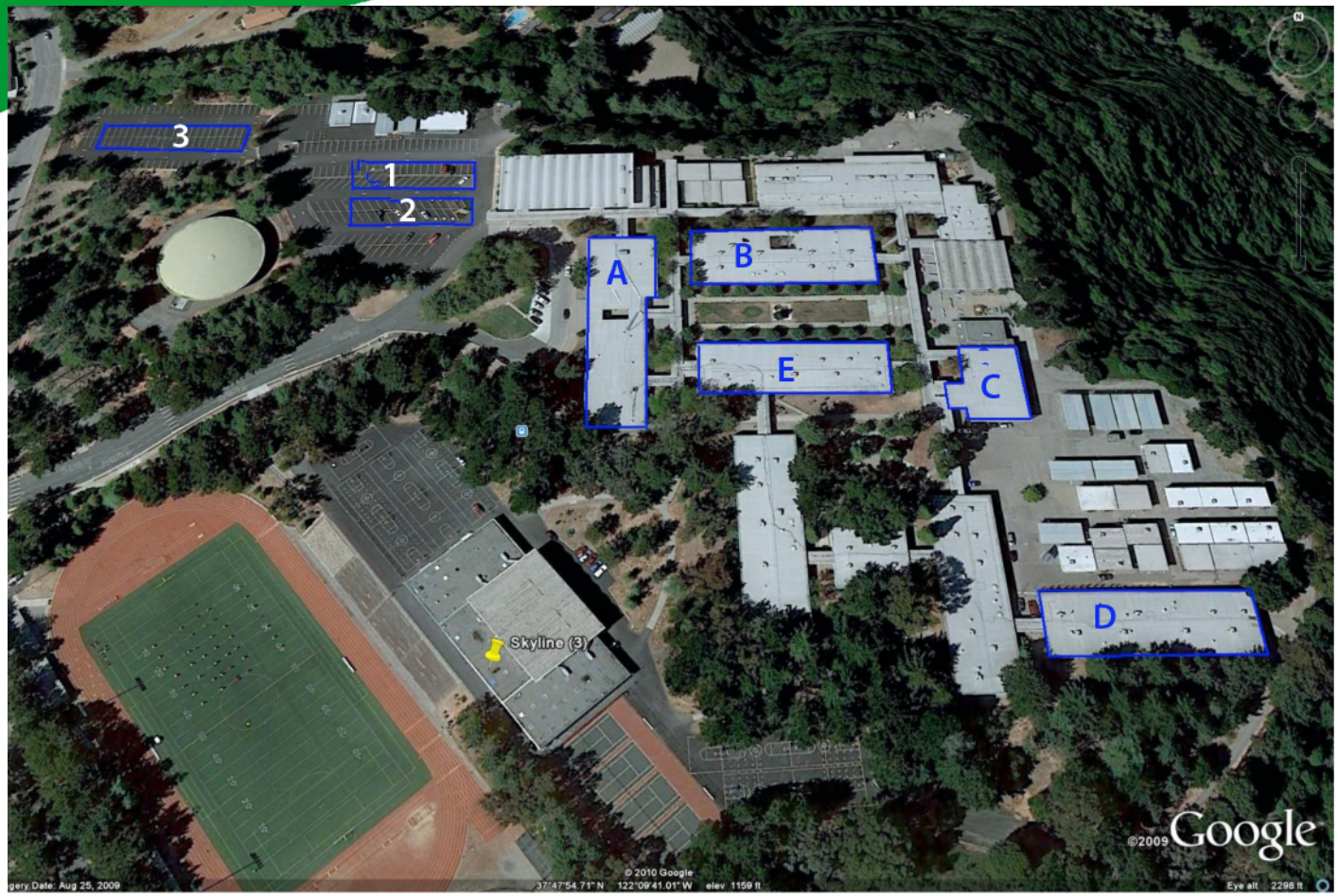
- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***moderate–significant***
- A system size of ~262 kWp would produce ~75% of the school's load.

Greenhouse Gases Avoided Annually:
69 metric tons

Renewable Energy Credits Generated Annually:
270

Skyline High School

12250 Skyline Boulevard



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Annual Electricity Cost and Consumption
Cost: $177,791
Consumption: 1,201,738 kWh

Contextual Data

- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***clear–significant***
- A system size of ~668 kWp would produce ~75% of the school's load.

Greenhouse Gases Avoided Annually:
165 metric tons

Renewable Energy Credits Generated Annually:
648

Skyline High School *continued*

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	3,564	20		20				
Roof B	4,860	30		30				
Roof C	2,520	30		30				
Roof D	4,860	30		30				
Roof E	4,860	30		30				
Parking 1	6,475		110	110				
Parking 2	6,475		110	110				
Parking 3	7,175		120	120				
Totals	**40,489**	**140**	**340**	**480**	**$2,734,000**	**$282,283**	**648,000**	**54%**
System size and pricing to meet current electricity demand				*	*	*	*	*

*Estimated PV capacity is not enough to offset current electricity consumption

Sobrante Park Elementary

470 El Paseo Drive

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	11,050	90		90				
Roof B	8,250	110		110				
Roof C	7,175	90		90				
Totals	**26,475**	**290**	**0**	**290**	**$1,421,000**	**$170,546**	**391,500**	**315%**
System size and pricing to meet current electricity demand				**69**	**$359,493**	**$40,657**	**93,330**	**75%**

Annual Electricity Cost and Consumption
Cost: $21,953
Consumption: 124,440 kWh

Contextual Data

- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***clear–moderate***

Greenhouse Gases Avoided Annually:
24 metric tons

Renewable Energy Credits Generated Annually:
93

Special Education Office

2850 West Street

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	11,253	80		80				
Roof B	5,720	90		90				
Roof C	3,125	40		40				
Totals	**20,098**	**210**	**0**	**210**	**$1,092,000**	**$123,499**	**283,500**	**66%**
System size and pricing to meet current electricity demand				*	*	*	*	*

*Estimated PV capacity is not enough to offset current electricity consumption

Annual Electricity Cost and Consumption
Cost: $75,083
Consumption: 431,280 kWh

Contextual Data

- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***clear–significant***
- A system size of ~240 kWp would produce ~75% of the school's load.

Greenhouse Gases Avoided Annually:
72 metric tons

Renewable Energy Credits Generated Annually:
284

Thornhill Elementary

5880 Thornhill Drive

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	22,500	150		150				
Totals	**22,500**	**150**	**0**	**150**	**$780,000**	**$88,213**	**202,500**	**182%**
System size and pricing to meet current electricity demand				**62**	**$322,053**	**$36,422**	**83,610**	**75%**

Annual Electricity Cost and Consumption
Cost: $18,968
Consumption: 111,480 kWh

Contextual Data
- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***significant***

Greenhouse Gases Avoided Annually:
21 metric tons

Renewable Energy Credits Generated Annually:
84

Tilden Elementary

4655 Steele Street

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	13,275	90		90				
Totals	**13,275**	**90**	**0**	**90**	**$468,000**	**$52,928**	**121,500**	**69%**
System size and pricing to meet current electricity demand				*	*	*	*	*

*Estimated PV capacity is not enough to offset current electricity consumption

Annual Electricity Cost and Consumption
Cost: $31,625
Consumption: 175,600 kWh

Contextual Data

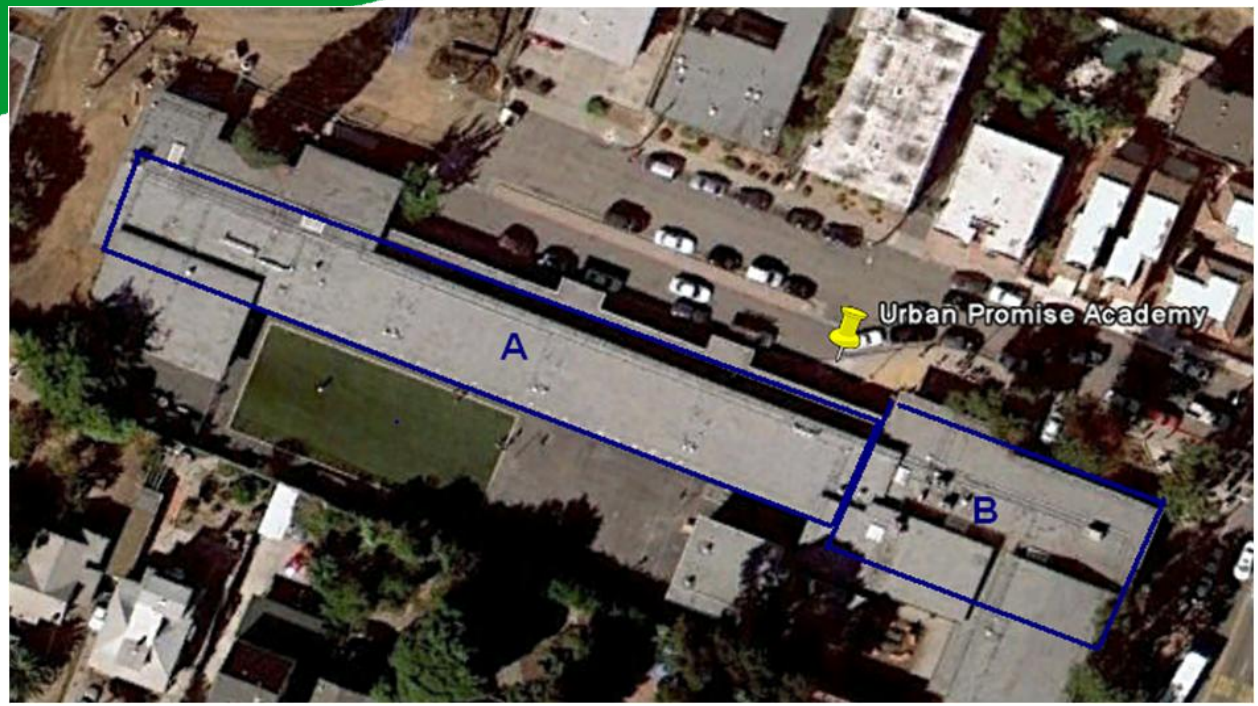
- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***significant***
- A system size of ~98 kWp would produce ~ 75% of the school's load.

Greenhouse Gases Avoided Annually:
31 metric tons

Renewable Energy Credits Generated Annually:
122

Urban Promise Academy

3031 East 18th Street



LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	12,284	130		130				
Roof B	7,600	50		50				
Totals	**19,884**	**180**	**0**	**180**	**$936,000**	**$105,856**	**243,000**	**177%**
System size and pricing to meet current electricity demand				**76**	**$395,758**	**$44,758**	**102,745**	**75%**

Annual Electricity Cost and Consumption
Cost: $23,617
Consumption: 136,993 kWh

Contextual Data
- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***minimal–significant***

Greenhouse Gases Avoided Annually:
26 metric tons

Renewable Energy Credits Generated Annually:
103

Warehouse

900 High Street

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	67,525	690		690				
Roof B	25,000	260		260				
Totals	**92,525**	**950**	**0**	**950**	**$4,275,000**	**$558,685**	**1,282,500**	**308%**
System size and pricing to meet current electricity demand				**231**	**$1,201,316**	**$135,862**	**311,880**	**75%**

Annual Electricity Cost and Consumption
Cost: $66,009
Consumption: 415,840 kWh

Contextual Data

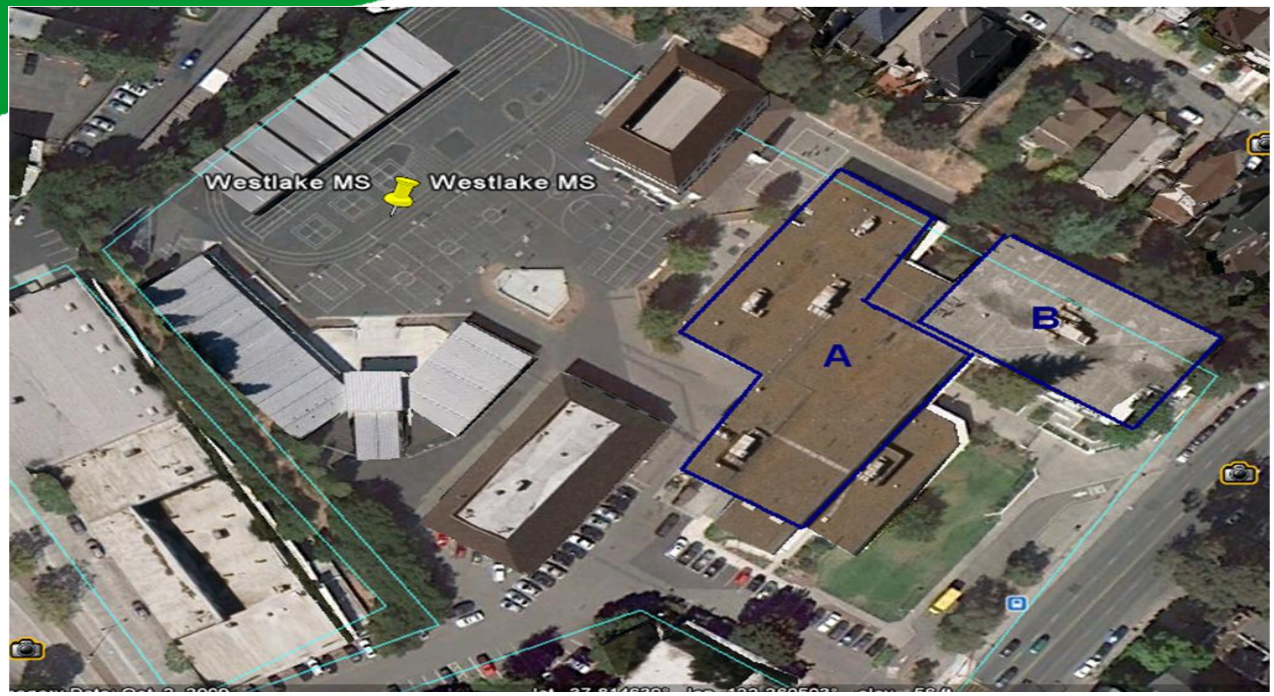
- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***minimal***

Greenhouse Gases Avoided Annually:
79 metric tons

Renewable Energy Credits Generated Annually:
312

Westlake Middle School

2629 Harrison Street



LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	22,220	150		150				
Roof B	12,325	80		80				
Totals	**34,545**	**230**	**0**	**230**	**$1,196,000**	**$213,650**	**310,500**	**74%**
System size and pricing to meet current electricity demand				*	*	*	*	*

*Estimated PV capacity is not enough to offset current electricity consumption

Annual Electricity Cost and Consumption
Cost: $68,864
Consumption: 421,440 kWh

Contextual Data

- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***significant***
- A system size of ~234 kWp would produce ~ 75% of the school's load.

Greenhouse Gases Avoided Annually:
79 metric tons

Renewable Energy Credits Generated Annually:
311

Whittier Elementary

6328 East 17th Street

LOCATION	GROSS AVAILABLE AREA (FT^2)	ESTIMATED PV CAPACITY (kWp)			ESTIMATED SYSTEM COST	CSI REBATE	ESTIMATED OUTPUT OF PV SYSTEM (kWh)	% USAGE OFFSET BY PV
		ROOFTOP	PARKING	=TOTAL				
Roof A	28,125	290		290				
Roof B	9,000	90		90				
Totals	**37,125**	**380**	**0**	**380**	**$1,862,000**	**$223,474**	**513,000**	**339%**
System size and pricing to meet current electricity demand				**84**	**$437,262**	**$49,452**	**113,520**	**75%**

Annual Electricity Cost and Consumption
Cost: $25,600
Consumption: 151,360 kWh

Contextual Data

- What are age & condition of roofs?
- Are there roof structural concerns?
- Roof obstructions: ***minimal***

Greenhouse Gases Avoided Annually:
29 metric tons

Renewable Energy Credits Generated Annually:
114

APPENDICES

- **Appendix A—Schools Not Assessed**
- **Appendix B—Annual Cost and Consumption**
- **Appendix C—List of Schools Selected for Renewable Energy Systems**

APPENDIX A

Schools and District Facilities Not Assessed

These schools were not assessed for one or more of the following reasons: roof orientation, ease of access, roof type, presence of obstructions and shading. OUSD also operates a number of Child Development Centers (CDC) throughout the City. Some of these CDCs are part of other school facilities or stand on their own. We have not benchmarked the energy use or solar potential for any of the CDCs.

Barack Obama Academy	9736 Lawlor Street	Small Roofs–excluded
B & G	4224 Wattling Street	
Bond Street	1702 45th Avenue	
Burckhalter Elementary	3994 Burckhalter Avenue	Small Roofs–excluded
Chabot Elementary	6686 Chabot Road	Portable Classrooms, Tilted Roofs–excluded
Cole Middle School	10th & Union	Small Roofs–excluded
Downtown Education Complex	1025 2nd Avenue	When opened this site will incorporate La Escuelita, Met West, and Dewey Academy.
Far West Academy	5263 Broadway Terrace	Small Roofs–excluded
La Escuelita Elementary	E 11th St & 4th Avenue	Small Roofs–excluded
Lakeview Elementary	746 Grand Avenue	Small Roof And Portable Classrooms–excluded
Lazear Elementary	824 29th Avenue	Portable Classrooms–excluded
Maxwell Park Elementary	4730 Fleming Avenue	Small Roofs–excluded
Neighborhood Adult Education	750 International Boulevard	Small Roof–excluded
New Highland Campus	1322 86th Avenue	Small Roofs–excluded
Old Chabot Science Center	4917 Mountain Boulevard	Shaded Small Roof–excluded
Peralta Elementary	460 63rd Street	Small Roofs–excluded
Redwood Heights Elementary	4401 39th Avenue	Slope & Small Roof–excluded
Street Academy	417 29th Street	
Washington Elementary	581 61st Street	Small Roof–excluded
Webster Academy	8000 Birch Street	Small Roofs–excluded
Woodland Elementary	1025 81st Avenue	Sloped/Tilted Roofs

Note: Most of the roofs at these schools are estimated to be 12,000 sq ft or below.

APPENDIX B

Annual Cost and Consumption: Electricity

OUSD FACILITY	ANNUAL kWh	ANNUAL COST	% OF TOTAL kWh	% OF TOTAL $	COMMENTS
Allendale Elementary	172,320	$29,014	0.64%	0.68%	
Ascend Elementary	403,840	$63,924	1.51%	1.50%	greater than 1% of total consumption
B&G*	101,920	$19,853	0.38%	0.47%	
Barack Obama Academy*	62,880	$10,947	0.23%	0.26%	
Bella Vista	169,249	$30,124	0.63%	0.71%	
Bond Street*	15,540	$2,958	0.06%	0.07%	
Bret Harte Middle	471,920	$72,353	1.76%	1.70%	greater than 1% of total consumption
Brookfield Elementary	239,372	$39,200	0.89%	0.92%	
Bunche Academy	162,400	$28,167	0.61%	0.66%	
Burbank Middle	99,000	$19,075	0.37%	0.45%	
Burckhalter Elementary*	82,435	$15,614	0.31%	0.37%	
Carl Munck Elementary	146,840	$26,646	0.55%	0.62%	
Carter/Oakland Int'l High School	599,419	$90,968	2.24%	2.13%	greater than 1% of total consumption
Castlemont	1,432,121	$190,561	5.35%	4.47%	greater than 3% of total consumption
Cesar Chavez Elementary	487,200	$75,893	1.82%	1.78%	greater than 1% of total consumption
Chabot Elementary*	253,760	$42,959	0.95%	1.01%	
Claremont Middle	294,960	$47,795	1.10%	1.12%	greater than 1% of total consumption
Cleveland Elementary	161,120	$25,636	0.60%	0.60%	
Cole Middle*	134,760	$24,435	0.50%	0.57%	

* These schools and district facilities were not assessed for PV for one or more of the following reasons: roof orientation, ease of access, roof type, age, presence of obstructions and shading.

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APPENDIX B *continued*

Annual Cost and Consumption: Electricity

OUSD FACILITY	ANNUAL kWh	ANNUAL COST	% OF TOTAL kWh	% OF TOTAL $	COMMENTS
Cox Elementary	116,002	$20,424	0.43%	0.48%	
Crocker Elementary	130,960	$25,471	0.49%	0.60%	
Dewey Academy	210,600	$36,669	0.79%	0.86%	
Edna Brewer Middle	378,560	$65,460	1.41%	1.53%	greater than 1% of total consumption
Elmhurst Comm Prep	309,120	$49,974	1.15%	1.17%	greater than 1% of total consumption
Emerson Elementary	185,280	$31,031	0.69%	0.73%	
Esperanza (Stonehurst Campus)	376,840	$65,032	1.41%	1.52%	greater than 1% of total consumption
Franklin Elementary	253,080	$43,776	0.95%	1.03%	
Fremont High School	1,431,888	$204,444	5.35%	4.79%	greater than 3% of total consumption
Frick Middle	380,720	$56,813	1.42%	1.33%	greater than 1% of total consumption
Fruitvale Elementary	201,480	$32,515	0.75%	0.76%	
Garfield Elementary	324,000	$51,459	1.21%	1.21%	greater than 1% of total consumption
Glenview Elementary	128,040	$21,938	0.48%	0.51%	
Grass Valley Elementary	115,240	$19,708	0.43%	0.46%	
Havenscourt Middle	474,720	$75,659	1.77%	1.77%	greater than 1% of total consumption
Hillcrest Elementary	100,000	$16,582	0.37%	0.39%	
Hoover Elementary	172,200	$28,863	0.64%	0.68%	
Horace Mann Elementary	199,200	$32,860	0.74%	0.77%	
Howard Elementary	142,240	$25,845	0.53%	0.61%	

* These schools and district facilities were not assessed for PV for one or more of the following reasons: roof orientation, ease of access, roof type, age, presence of obstructions and shading.

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APPENDIX B *continued*

Annual Cost and Consumption: Electricity

OUSD FACILITY	ANNUAL kWh	ANNUAL COST	% OF TOTAL kWh	% OF TOTAL $	COMMENTS
Jefferson	326,720	$55,817	1.22%	1.31%	greater than 1% of total consumption
Joaquin Miller Elementary	143,680	$24,368	0.54%	0.57%	
Kaiser Elementary	77,200	$13,262	0.29%	0.31%	
Kings Estate Middle	313,200	$47,415	1.17%	1.11%	greater than 1% of total consumption
La Escuelita Elementary*	67,740	$11,808	0.25%	0.28%	
Lafayette Elementary	153,600	$25,802	0.57%	0.60%	
Lakeview Elementary*	112,320	$19,264	0.42%	0.45%	
Laurel Elementary	166,800	$27,853	0.62%	0.65%	
Lazear Elementary*	168,640	$28,722	0.63%	0.67%	
Life Academy	256,320	$42,035	0.96%	0.99%	
Lincoln Elementary	125,800	$21,141	0.47%	0.50%	
Lockwood Elementary	234,560	$45,340	0.88%	1.06%	
Longfellow	205,760	$32,634	0.77%	0.77%	
Lowell Middle	364,610	$54,151	1.36%	1.27%	greater than 1% of total consumption
Madison Middle	326,160	$50,308	1.22%	1.18%	greater than 1% of total consumption
Manzanita	332,000	$51,893	1.24%	1.22%	greater than 1% of total consumption
Markham Elementary	172,800	$30,967	0.65%	0.73%	
Marshall Elementary	167,280	$28,853	0.62%	0.68%	
Maxwell Park Elementary*	137,840	$24,055	0.51%	0.56%	

* These schools and district facilities were not assessed for PV for one or more of the following reasons: roof orientation, ease of access, roof type, age, presence of obstructions and shading.

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APPENDIX B *continued*

Annual Cost and Consumption: Electricity

OUSD FACILITY	ANNUAL kWh	ANNUAL COST	% OF TOTAL kWh	% OF TOTAL $	COMMENTS
McClymonds High	607,265	$90,666	2.27%	2.13%	greater than 1% of total consumption
Melrose Elementary	169,920	$29,137	0.63%	0.68%	
Met West*	0	$0	0.00%	0.00%	
MLK Jr Elementary	361,920	$60,963	1.35%	1.43%	greater than 1% of total consumption
Montclair Elementary	189,856	$34,667	0.71%	0.81%	
Montera Middle	428,273	$67,556	1.60%	1.58%	greater than 1% of total consumption
Neighborhood Adult*	23,620	$4,076	0.09%	0.10%	
Neighbd Adult Education*	80,400	$14,851	0.30%	0.35%	
New Highland Academy	360,320	$58,731	1.35%	1.38%	greater than 1% of total consumption
Oakland High	1,706,498	$248,983	6.38%	5.84%	greater than 3% of total consumption
Oakland Tech	1,261,568	$192,553	4.71%	4.51%	greater than 3% of total consumption
Old Chabot Science Center*	89,515	$15,482	0.33%	0.36%	
Parker Elementary	160,960	$25,680	0.60%	0.60%	
Peralta Elementary*	142,720	$25,167	0.53%	0.59%	
Piedmont Elementary	167,520	$27,251	0.63%	0.64%	
Prescott/Prep Literary Academy	325,920	$50,877	1.22%	1.19%	greater than 1% of total consumption
Redwood Heights Elementary*	146,080	$23,754	0.55%	0.56%	
Roosevelt Middle	507,840	$87,400	1.90%	2.05%	greater than 1% of total consumption
Rusdale Continuation	94,560	$18,550	0.35%	0.43%	

* These schools and district facilities were not assessed for PV for one or more of the following reasons: roof orientation, ease of access, roof type, age, presence of obstructions and shading.

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APPENDIX B *continued*

Annual Cost and Consumption: Electricity

OUSD FACILITY	ANNUAL kWh	ANNUAL COST	% OF TOTAL kWh	% OF TOTAL $	COMMENTS
Santa Fe Elementary	153,920	$25,487	0.58%	0.60%	
Sequoia Elementary	158,240	$26,539	0.59%	0.62%	
Sherman	106,640	$18,228	0.40%	0.43%	
Simmons Middle	471,360	$68,861	1.76%	1.61%	greater than 1% of total consumption
Skyline High	1,201,738	$177,791	4.49%	4.17%	greater than 3% of total consumption
Sobrante Park Elementary	124,440	$21,953	0.46%	0.51%	
Special Ed Admin	431,280	$75,083	1.61%	1.76%	greater than 1% of total consumption
Street Academy*	52,840	$9,928	0.20%	0.23%	
Thornhill Elementary	111,480	$18,968	0.42%	0.44%	
Tilden Elementary	175,600	$31,625	0.66%	0.74%	
Urban Promise Academy	136,993	$23,617	0.51%	0.55%	
Warehouse	415,840	$66,009	1.55%	1.55%	greater than 1% of total consumption
Washington Elementary*	108,640	$20,815	0.41%	0.49%	
Webster Academy*	284,160	$45,066	1.06%	1.06%	greater than 1% of total consumption
Westlake Middle	421,440	$68,864	1.57%	1.61%	greater than 1% of total consumption
Whittier Elementary	151,360	$25,600	0.57%	0.60%	
Woodland Elementary*	462,720	$68,667	1.73%	1.61%	greater than 1% of total consumption
Totals	**26,767,702**	**$4,265,776**	**100%**	**100%**	

* These schools and district facilities were not assessed for PV for one or more of the following reasons: roof orientation, ease of access, roof type, age, presence of obstructions and shading.

APPENDIX C

List of Schools Selected for Renewable Energy Systems

Oakland Unified School District has formally reserved California Solar Initiative (CSI) rebates. The rebates will be worth more than $5M if all 17 PV systems are built as described in the CSI reservation request. The school sites are listed below. They were selected—in part—because they are significant consumers of electricity. The District will have the opportunity to shift the rebate reservations to other schools if it is determined that the current site does not offer the best opportunity to install a large PV system.

Bret Harte Middle School
Carter/Oakland International High School
Castlemont High
Claremont Middle School
Edna Brewer Middle School
Fremont High School
Havenscourt Middle School
King Estates Middle School
Lowell Middle School
McClymonds High School
Montera Middle School
Oakland High School
Oakland Tech
Roosevelt Middle School
Santa Fe Elementary
Westlake Middle School
Woodland Elementary