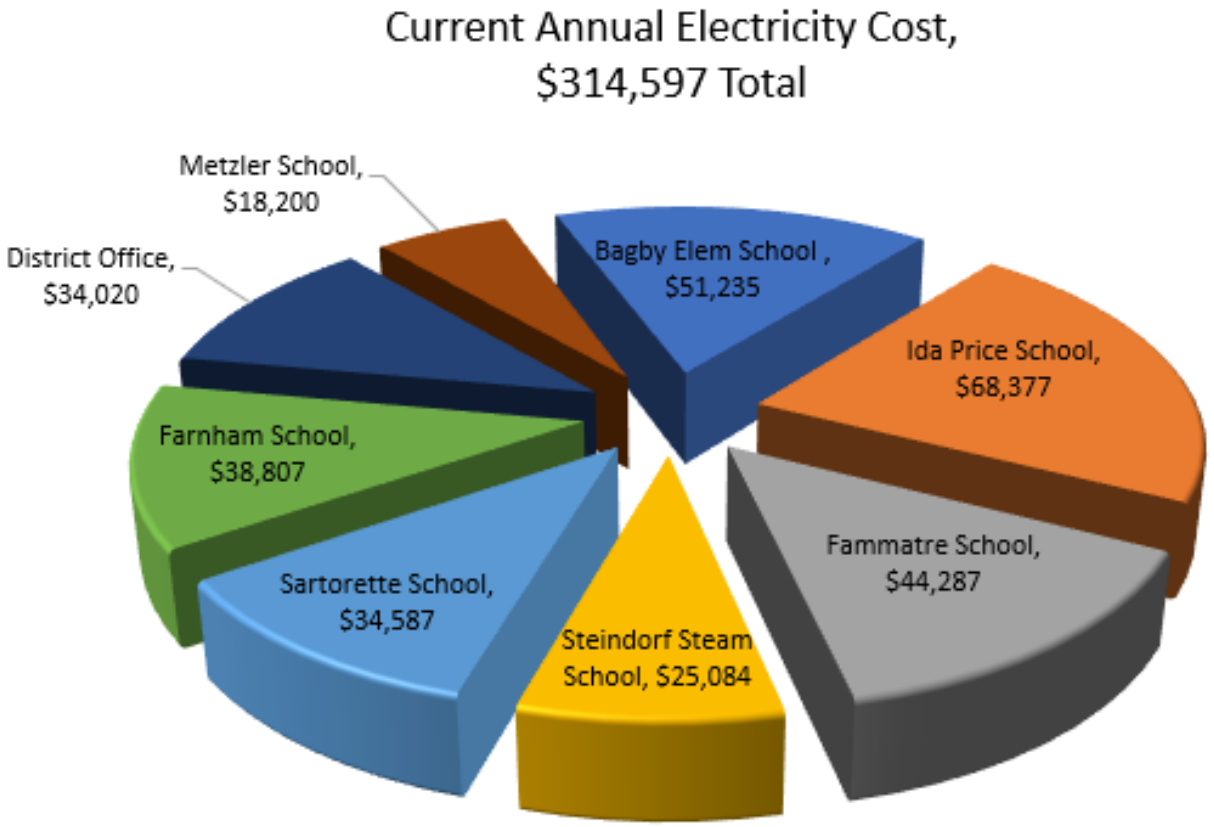
Appendix 1

Utility Analysis

Utility Analysis

Electricity Data

School	Annual Usage (kWh)	Cost	Cost per kWh
BAGBY ELEM SCHOOL #1	134,022	$30,205	$0.2254
BAGBY ELEM SCHOOL #2	79,795	$21,029	$0.2635
IDA PRICE SCHOOL	260,912	$68,377	$0.2621
FAMMATRE SCHOOL	164,116	$44,287	$0.2698
STEINDORF STEAM SCHOOL	99,985	$25,084	$0.2509
SARTORETTE SCHOOL	149,316	$34,587	$0.2316
FARNHAM SCHOOL	131,337	$38,807	$0.2955
DISTRICT OFFICE	115,487	$34,020	$0.2946
METZLER SCHOOL	63,481	$18,200	$0.2867
Totals	**1,198,451**	**$314,597**	**$0.2625**



The Electricity usage data showed large solar true-up costs once a year at five sites. The total cost for this true-up was **$102,834** out of the total cost of **$314,597** which is almost **33%** of the annual cost for electricity.

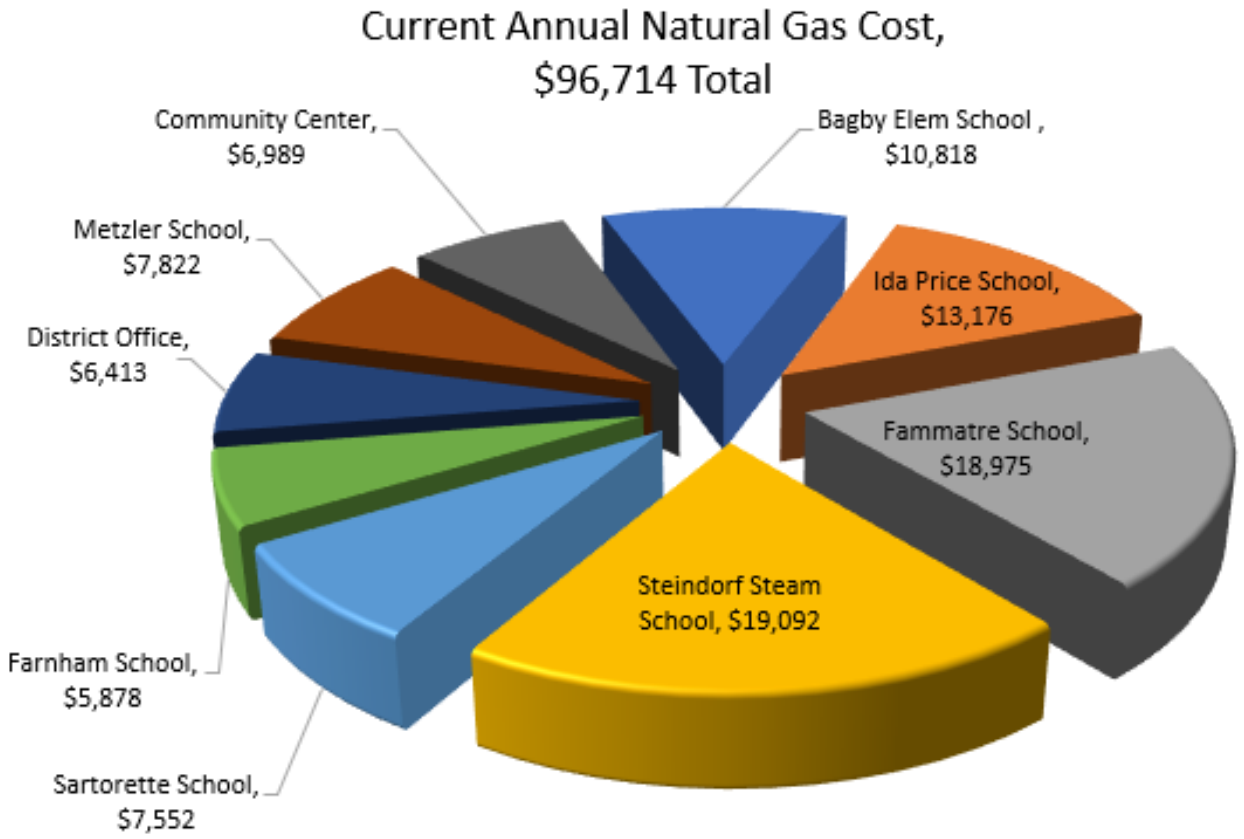
These true-up costs occur when additional load has been added, solar is undersized or solar is not producing at its expected capacity.

Utility Analysis (cont.)

Natural Gas Data

School	Natural Gas Usage (Therms)	Cost	Cost per Therm
BAGBY ELEM SCHOOL #1	5,811	$8,661	$1.49
BAGBY ELEM SCHOOL #2	1,318	$2,156	$1.64
IDA PRICE SCHOOL	9,699	$13,176	$1.36
FAMMATRE SCHOOL	14,235	$18,975	$1.33
STEINDORF STEAM SCHOOL	14,225	$19,092	$1.34
SARTORETTE SCHOOL	4,008	$7,552	$1.88
FARNHAM SCHOOL	3,850	$5,878	$1.53
DISTRICT OFFICE	4,724	$6,413	$1.36
METZLER SCHOOL	5,732	$7,822	$1.36
COMMUNITY CENTER	5,421	$6,989	$1.29
Totals	**69,023**	**$96,714**	**$1.40**

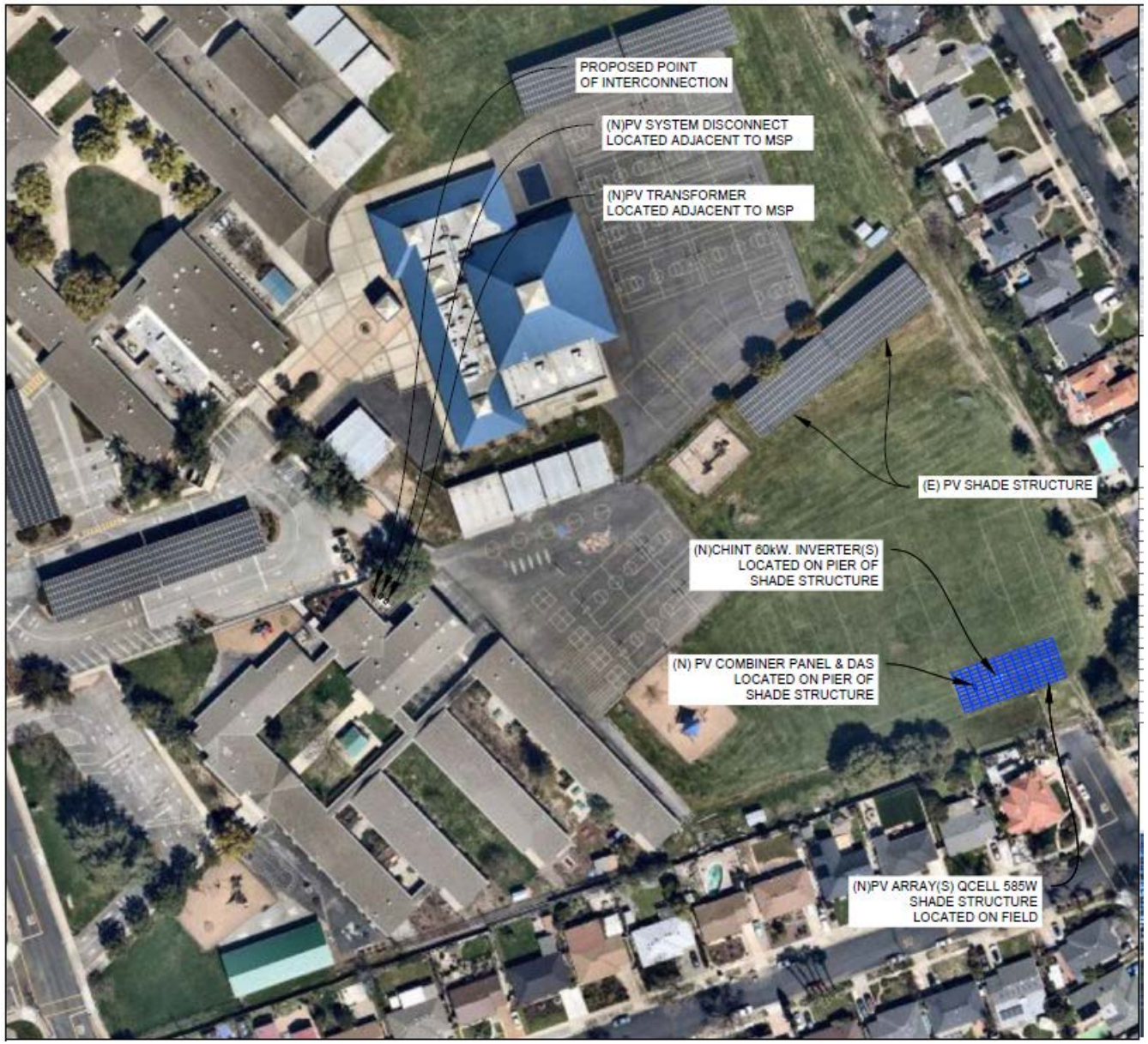
Fammatre and Steindorf Steam Schools had the largest natural gas loads which is likely higher heating setpoints and some older less efficient heating systems.



Appendix 2

Solar Specs

ECM #2b – Solar Photovoltaics



Affected Sites

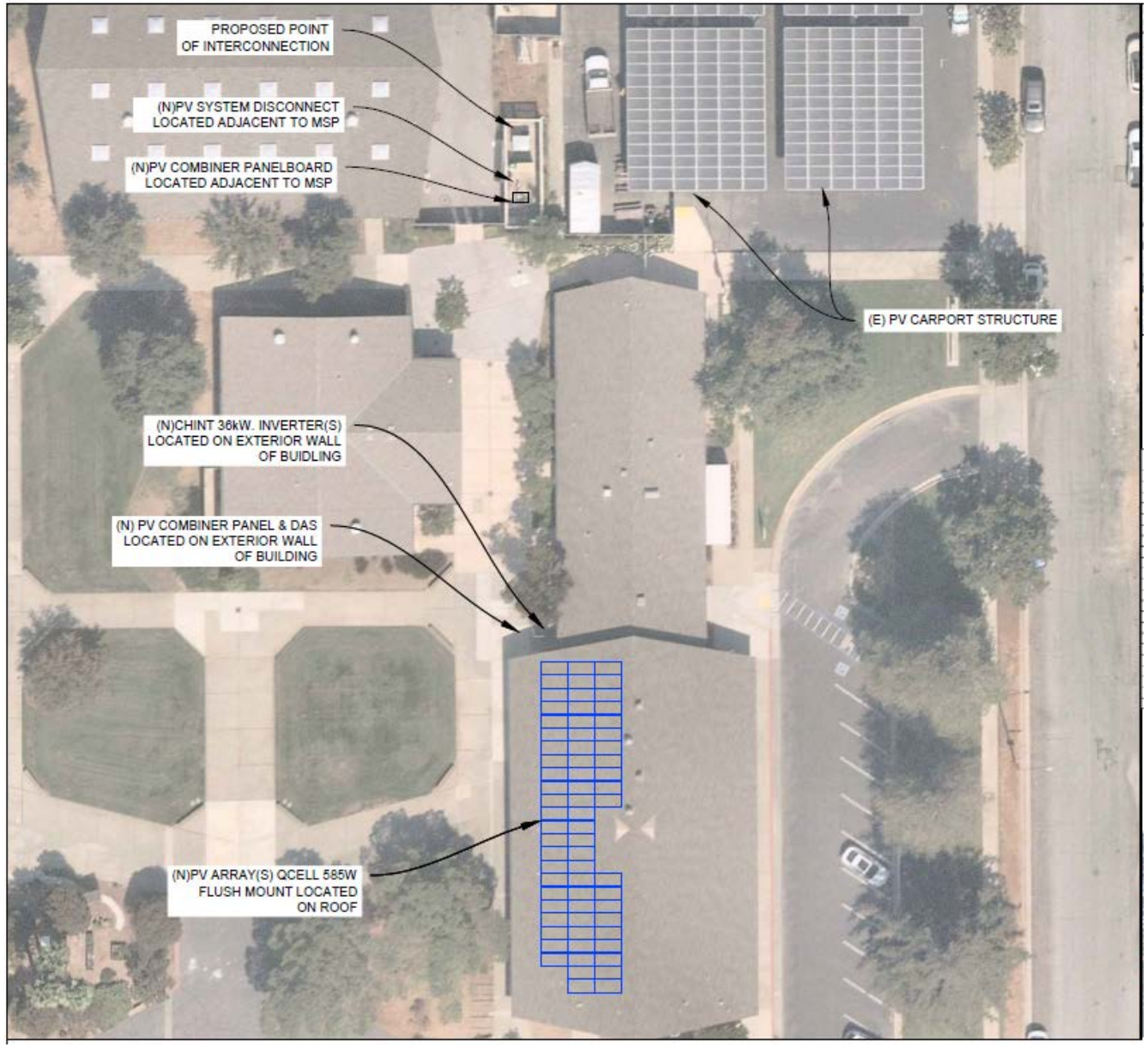
- Fammatre School

ECM Description

Install 70.2 kW solar photovoltaic carport structure to offset electric consumption.

System Specification	
Meter Number	1010076874
Parcel Number/APN	442-20-001
Utility	PGE
AHJ	CITY OF SAN JOSE
Total kWDC	70.2
Total kWAC	60
Total kWAC CEC	64.1
Estimated Prodcution Ration (kWh/kWp)	1,573.70
Estimated Annual Production	110.5MWh
Racking	SHADE STRUCTURE
Tilt Angle (Degree)	7
Azimuth (Degree)	161
Module Type	HanwhaQCELLS Q.PEAK DUO XL-G11S.3/BFG 585
Module Quantity	120
Optimizer/RSD Unit Make and Model	TS4-A-F
Optimizer/RSD Unit Quantity	0
Total number of inverters (see SLD for details)	1
Transformer Size and Quantity	225KVA
Interconnection Voltage	208/120V
Client Main Switch Board/Gear Rating	2000A
Client Main Breaker Rating	2000A
Point of Interconnection	SUPPLY SIDE CONNECTION

ECM #2c – Solar Photovoltaics



Affected Sites

- District Office

ECM Description

Install 39.78 kW solar photovoltaic rooftop flushmount to offset electric consumption.

System Specification	
Meter Number	10068202O1
Parcel Number/APN	421-02-089
Utility	PGE
AHJ	CITY OF SAN JOSE
Total kWDC	39.78
Total kWAC	36
Total kWAC CEC	36.1
Estimated Prodcution Ration (kWh/kWp)	1,353.40
Estimated Annual Production	53.84MWh
Racking	FLUSH MOUNT
Tilt Angle (Degree)	16
Azimuth (Degree)	270
Module Type	HanwhaQCELLS Q.PEAK DUO XL-G11S.3/BFG 585
Module Quantity	68
Optimizer/RSD Unit Make and Model	TS4-A-F
Optimizer/RSD Unit Quantity	68
Total number of inverters (see SLD for details)	1
Transformer Size and Quantity	N/A
Interconnection Voltage	480/277V
Client Main Switch Board/Gear Rating	600A
Client Main Breaker Rating	600A
Point of Interconnection	SUPPLY SIDE CONNECTION

ECM #2d – Solar Photovoltaics

Affected Sites

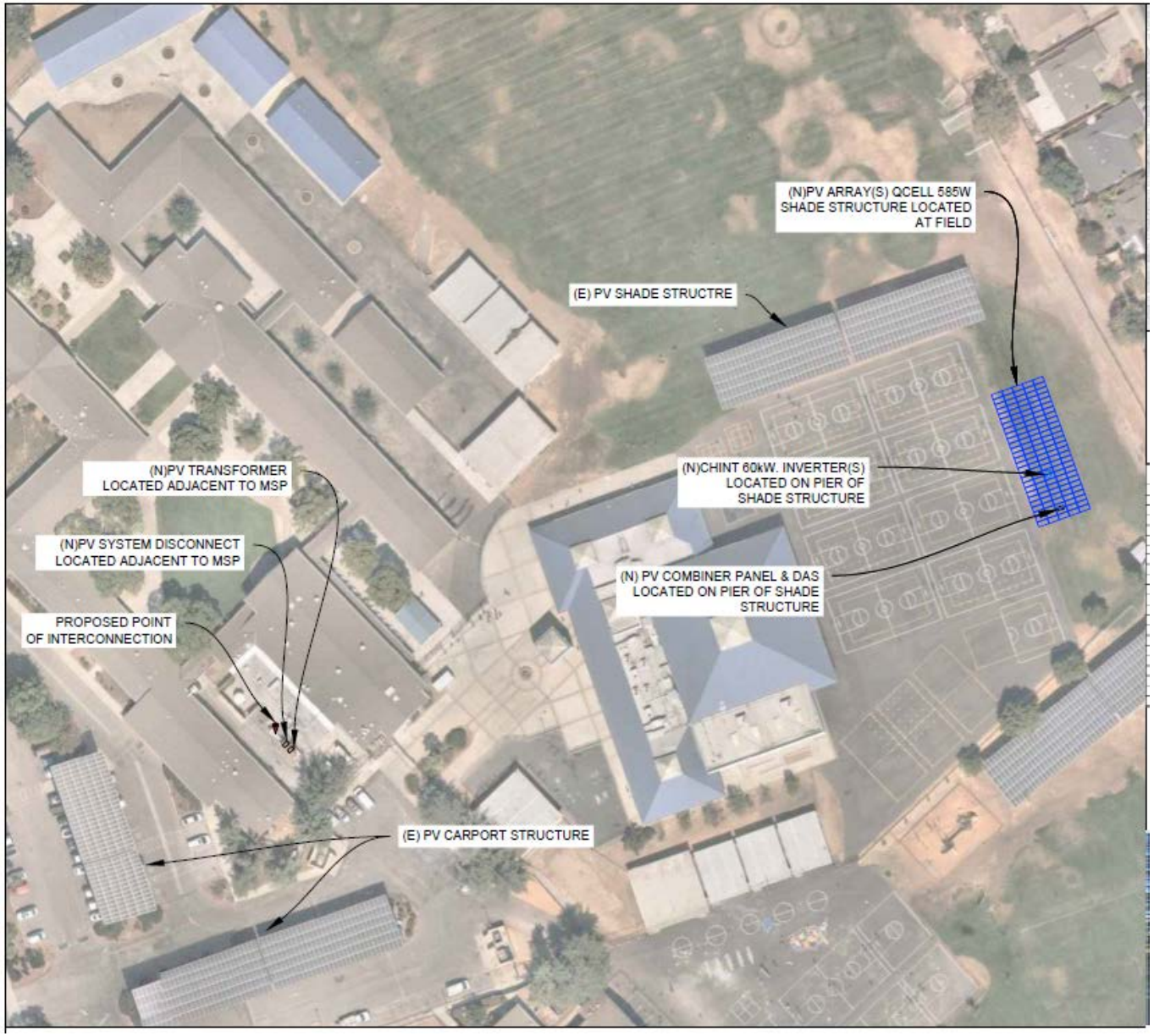
- Bagby School

ECM Description

Install 99.45 kW solar photovoltaic carport structure to offset electric consumption.

System Specification	
Meter Number	1009507280
Parcel Number/APN	442-17-047
Utility	PGE
AHJ	CITY OF SAN JOSE
Total kWDC	99.45
Total kWAC	100
Total kWAC CEC	90.8
Estimated Prodcution Ration (kWh/kWp)	1,483.40
Estimated Annual Production	147.5MWh
Racking	CARPORT
Tilt Angle (Degree)	7
Azimuth (Degree)	160
Module Type	HanwhaQCELLS Q.PEAK DUO XL-G11S.3/BFG 585
Module Quantity	170
Optimizer/RSD Unit Make and Model	TS4-A-F
Optimizer/RSD Unit Quantity	0
Total number of inverters (see SLD for details)	2
Transformer Size and Quantity	150KVA
Interconnection Voltage	208/120V
Client Main Switch Board/Gear Rating	2000A
Client Main Breaker Rating	2000A
Point of Interconnection	SUPPLY SIDE CONNECTION

ECM #2e – Solar Photovoltaics



Affected Sites

- Ida Price Middle School

ECM Description

Install 78.975 kW solar photovoltaic carport structure to offset electric consumption.

System Specification	
Meter Number	1009486354
Parcel Number/APN	442-20-001
Utility	PGE
AHJ	CITY OF SAN JOSE
Total kWDC	78.975
Total kWAC	60
Total kWAC CEC	72.1
Estimated Prodcution Ration (kWh/kWp)	1,615.10
Estimated Annual Production	132.3MWh
Racking	SHADE STRUCTURE
Tilt Angle (Degree)	7
Azimuth (Degree)	250
Module Type	HanwhaQCELLS Q.PEAK DUO XL-G11S.3/BFG 585
Module Quantity	135
Optimizer/RSD Unit Make and Model	TS4-A-F
Optimizer/RSD Unit Quantity	0
Total number of inverters (see SLD for details)	1
Transformer Size and Quantity	450KVA
Interconnection Voltage	208/120V
Client Main Switch Board/Gear Rating	3000A
Client Main Breaker Rating	3000A
Point of Interconnection	SUPPLY SIDE CONNECTION

ECM #2f – Solar Photovoltaics

Affected Sites

- Sartorette School

ECM Description

Install 68.445 kW solar photovoltaic carport structure to offset electric consumption.

System Specification	
Meter Number	1008844753
Parcel Number/APN	447-29-038
Utility	PGE
AHJ	CITY OF SAN JOSE
Total kWDC	68.445
Total kWAC	60
Total kWAC CEC	62.5
Estimated Prodcution Ration (kWh/kWp)	1,548.10
Estimated Annual Production	106MWh
Racking	CARPORT
Tilt Angle (Degree)	7
Azimuth (Degree)	245
Module Type	HanwhaQCELLS Q.PEAK DUO XL-G11S.3/BFG 585
Module Quantity	117
Optimizer/RSD Unit Make and Model	TS4-A-F
Optimizer/RSD Unit Quantity	0
Total number of inverters (see SLD for details)	1
Transformer Size and Quantity	225KVA
Interconnection Voltage	208/120V
Client Main Switch Board/Gear Rating	2000A
Client Main Breaker Rating	2000A
Point of Interconnection	SUPPLY SIDE CONNECTION

ECM #2g – Solar Photovoltaics

Affected Sites

- Steindorf Steam School

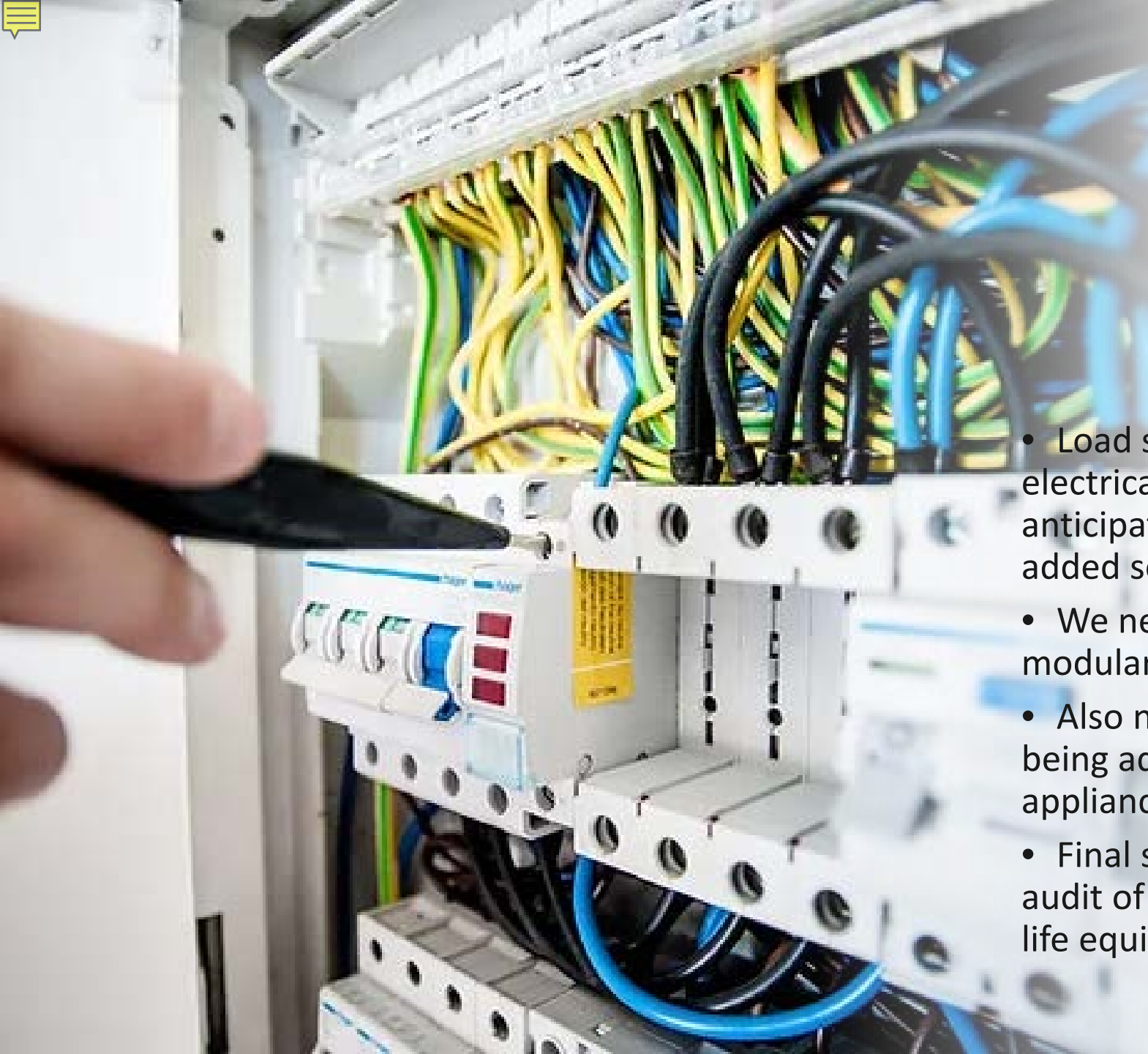
ECM Description

Install 70.2 kW solar photovoltaic carport structure to offset electric consumption.

System Specification	
Meter Number	1010046097
Parcel Number/APN	419-05-007
Utility	PGE
AHJ	CITY OF SAN JOSE
Total kWDC	70.2
Total kWAC	50
Total kWAC CEC	63.8
Estimated Prodcution Ration (kWh/kWp)	1,519.50
Estimated Annual Production	106.7MWh
Racking	CARPORT
Tilt Angle (Degree)	7
Azimuth (Degree)	150
Module Type	HanwhaQCELLS Q.PEAK DUO XL-G11S.3/BFG 585
Module Quantity	120
Optimizer/RSD Unit Make and Model	TS4-A-F
Optimizer/RSD Unit Quantity	0
Total number of inverters (see SLD for details)	2
Transformer Size and Quantity	N/A
Interconnection Voltage	208/120V
Client Main Switch Board/Gear Rating	1600A
Client Main Breaker Rating	1600A
Point of Interconnection	SUPPLY SIDE CONNECTION

Appendix 3

Electrical Distribution
System Upgrade



Electrical Distribution System: Investigation in process

- Load study has been mostly completed on the electrical distribution system, including the anticipated savings from this project as well as the added solar capacity
- We need anticipated electrical load on the new modulars
- Also needed is the inventory list of equipment being added to the kitchens, specifically electrical appliances
- Final step will be propose to the District a full audit of all equipment so we can determine end of life equipment

Appendix 4

Drop Ceiling Calcs

Drop Ceiling Retrofit Calculations

Typical Classroom (15 ft Existing)						
Winter Outdoor Design	35.7			Winter indoor Design	70	
Summer Outdoor Design	92.4			Summer indoor Design	74	
First Floor	Area	U-Factor	Summer dT	Winter dT	Summer BTUH	Winter BTUH
Glazing Area	40	1.220	18	34.3	898	1,674
Door Area	25	0.700	18	34.3	322	599
Wall Area	1,950	0.520	18	34.3	18,658	34,780
Roof Area	1,092	0.083	18	34.3	1,674	3,121
Floor Perimeter	130	0.680	18	34.3	1,627	3,032
Lighting Heat Gain	630	-	18	34.3	2,150	-2,150
People Heat Gain	26	-	18	34.3	3,427	-1,713
Equip Heat Gain	-	-	18	34.3	0	0
Ventilation	390	-	18	34.3	7,750	14,447
Infiltration	187	-	18	34.3	3,707	6,911
Subtotal		-	18	34.3	40,212	60,702
Safety Factor	15%	-	18	34.3	6,032	9,105
Total					**46,244**	**69,808**

Typical Classroom (12 ft Drop Ceiling)						
Winter Outdoor Design	35.7			Winter indoor Design	70	
Summer Outdoor Design	92.4			Summer indoor Design	74	
First Floor	Area	U-Factor	Summer dT	Winter dT	Summer BTUH	Winter BTUH
Glazing Area	40	1.220	18	34.3	898	1,674
Door Area	25	0.700	18	34.3	322	599
Wall Area	1,560	0.520	18	34.3	14,926	27,824
Roof Area	1,092	0.033	18	34.3	670	1,249
Floor Perimeter	130	0.680	18	34.3	1,627	3,032
Lighting Heat Gain	525	-	18	34.3	1,791	-1,791
People Heat Gain	26	-	18	34.3	3,427	-1,713
Equip Heat Gain	-	-	18	34.3	0	0
Ventilation	390	-	18	34.3	7,750	14,447
Infiltration	167	-	18	34.3	3,320	6,189
Subtotal		-	18	34.3	34,730	51,509
Safety Factor	15%	-	18	34.3	5,210	7,726
Total					**39,940**	**59,236**

Drop Ceiling Retrofit Calculations

Existing Energy Usage

School	# Classrooms	Avg Square Footage Per Classroom	Total Classroom Sq Footage	School Buildings Total Square Footage	% of Sq Footage Consisting of Classrooms	Total School kWh Usage	Total School kWh Cost	Cost per kWh	Total School Natural Gas Usage Therms	Total Natural Gas Cost	Cost per Therm
Bagby	17	1,050	17,850	46,839	38.1%	213,817	$51,234	$0.2396	7,129	$10,817	$1.52
Fammatre	21	1,050	22,050	43,615	50.6%	164,116	$44,287	$0.2699	14,235	$18,975	$1.33
Sartorette	17	1,050	17,850	34,206	52.2%	149,316	$34,587	$0.2316	4,008	$7,552	$1.88
Farnham	17	1,050	17,850	38,432	46.4%	131,337	$38,807	$0.2955	3,850	$5,878	$1.53
Totals	**72**		**75,600**	**163,092**	**46.4%**	**658,586**	**$168,915**	**$0.2565**	**29,222**	**$43,222**	**$1.48**

Existing Heating & Cooling Loads

School	Total School Cooling Load kWh[1]	Total School Annual Hours of Cooling	Total School Heating Load Therm[2]	Total School Annual Hours of Heating
Bagby	39,927	173	3,133	399
Fammatre	40,656	142	7,291	753
Sartorette	38,180	166	2,995	380
Farnham	29,890	130	2,075	263
Totals	**148,653**	**611**	**15,494**	**1,795**

Notes:

1. Per Industry standards, 49% of electricity usage in schools is dedicated to HVAC (22% Cooling, 22% Ventilation, 5% Other HVAC related). Bagby school classroom cooling is then equal to 213,817 kWh * 38.1% (portion of schools that are classrooms) * 49% = 39,927 kWh.
2. Per Industry standards, 76% of natural gas usage in schools is dedicated to comfort heating.

Drop Ceiling Retrofit Calculations

Existing 15 ft Ceilings Classroom Heating & Cooling Loads

School	Classroom Peak Hour Cooling Load (BTU)	Classroom Peak Hour Heating Load (BTU)	Peak Hour Cooling Load For All Classrooms (BTU)	Calculated Cooling Load (kWh)	Cooling Cost	Calculated Peak Hour Heating Load (BTU)	Calculated Heating Load (Therms)
Bagby	46,244	69,808	786,143	39,858	$9,551	786,143	3,135
Fammatre	46,244	69,808	971,118	40,414	$10,906	971,118	7,313
Sartorette	46,244	69,808	786,143	38,246	$8,859	786,143	2,987
Farnham	46,244	69,808	786,143	29,951	$8,850	786,143	2,071
Totals	**184,975**	**279,230**	**3,329,548**	**148,470**	**$38,166**	**3,329,548**	**15,506**

Option 12 ft Ceilings Classroom Heating & Cooling Loads

School	Calculated Peak Hour Cooling Load (BTU)	Classroom Peak Hour Heating Load (BTU)	Peak Hour Cooling Load For All Classrooms (BTU)	Calculated Cooling Load (kWh)	Cooling Cost	Calculated Peak Hour Heating Load (BTUH)	Calculated Heating Load (Therms)
Bagby	39,940	59,236	678,972	34,425	$8,249	678,972	2,708
Fammatre	39,940	59,236	838,730	34,905	$9,419	838,730	6,316
Sartorette	39,940	59,236	678,972	33,032	$7,651	678,972	2,580
Farnham	39,940	59,236	678,972	25,868	$7,643	678,972	1,788
Totals	**159,758**	**236,943**	**2,875,644**	**128,230**	**$32,963**	**2,875,644**	**13,392**

Savings for Adding Drop Ceilings

School	Cooling Savings (kWh)	Cooling Savings	Heating Savings (Therms)	Heating Savings	Total Savings
Bagby	5,434	$1,302	427	$649	$1,951
Fammatre	5,509	$1,487	997	$1,329	$2,816
Sartorette	5,214	$1,208	407	$767	$1,975
Farnham	4,083	$1,206	282	$431	$1,637
Totals	**20,240**	**$5,203**	**2,114**	**$3,176**	**$8,379**

Appendix 5

CA Contracting Code 4217 and About Centrica

How You Receive Best Value

CA Government Code 4217 permits public entities to select and contract with a qualified Energy Services Company such as Centrica Business Solutions to develop and implement energy efficiency, renewable energy, and water-use efficiency projects.

The cost of the contract, including engineering, construction and maintenance, are completely recovered by the energy savings dollars generated from those contracts.

California Energy Efficiency Laws

CA Agency Code 4217

- **Implemented in the 1980's:** Designed to encourage the state, cities, counties, K-14 and special districts to implement energy efficiency projects. Allows public agencies to select a single qualified energy efficiency company to design and deliver a multi-measure project on a design-build basis if the following requirements are met:
  - **Energy savings generated by a project must exceed the cost of the project over the life of the system** (Not by individual measure but collectively as a project)
  - **The Board/Council must determine that the project is in the best interest of the entity** (why else would you do it) and the entity has broad flexibility to implement
  - **Public notice must be given and a public hearing held** (typically done at a board/council meeting as you do others)
- **Used by hundreds of public agencies in the state of California**. The law is well vetted as a useful means to procure professional services from qualified energy efficiency companies.

Centrica Business Solutions

$29 bn
Group revenue

Global 500
Energy Services Company

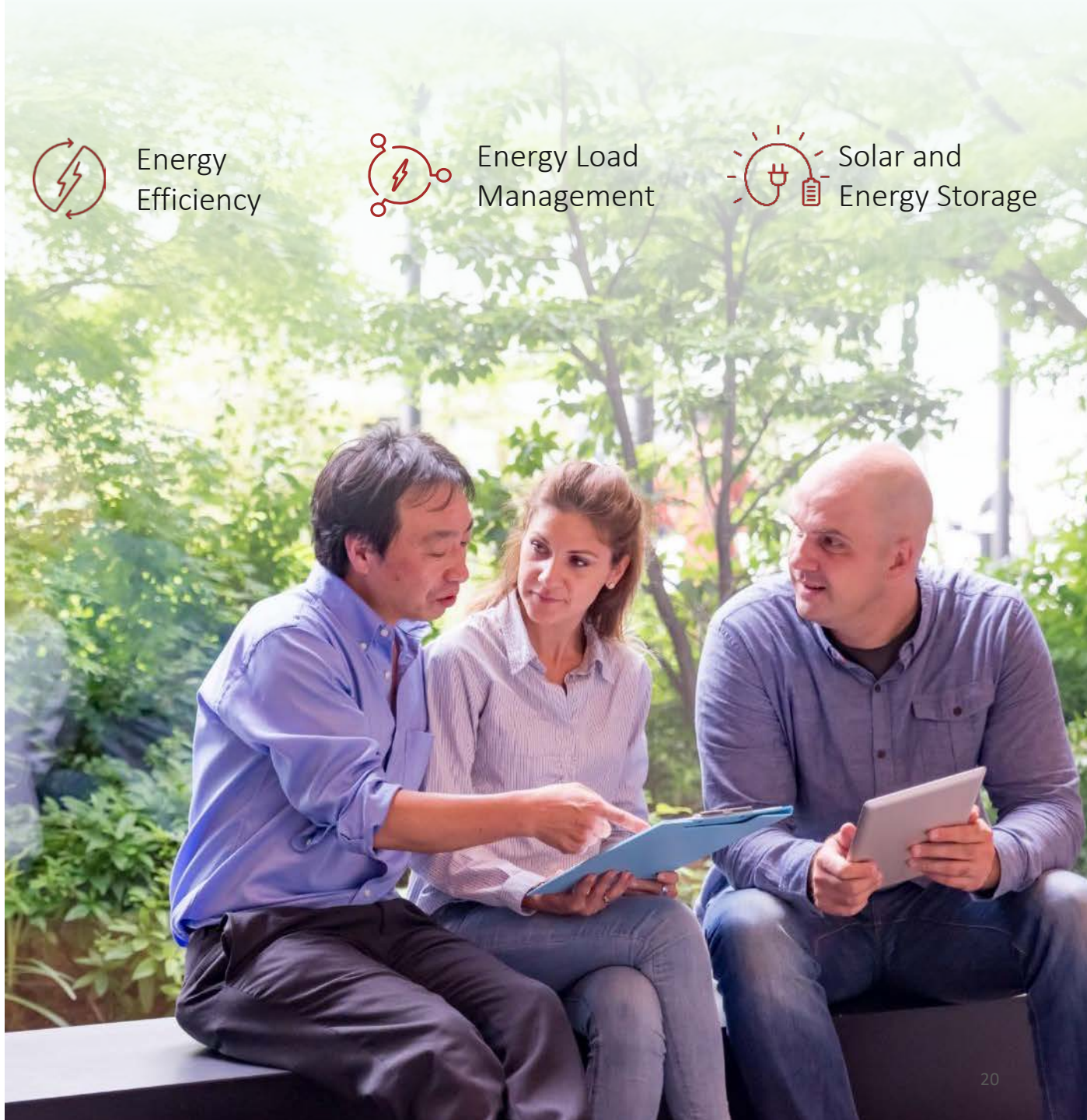
11 GW
Renewable Generation Under Management

25k+
Efficiency upgrades in the U.S.

We shape and deliver integrated energy solutions that deliver cost efficiency, resilience and accelerate your journey to a low-carbon future

U.S. DEPARTMENT OF ENERGY

NAESCO ACCREDITATION PROGRAM



Schools and Local Government Experience

Our local team can provide the right solutions for our clients.

- We have extensive experience professionally developing, designing, and delivering energy projects for state agencies, municipalities, schools, and universities.
- Our optimized solutions maximize value along every dimension through:
  - Guaranteed Performance
  - Financial Return
  - Environmental Responsibility
  - Human Impact.

We have local resources in northern CA: engineering, project management/ operations, admin/support

We have regional operations across the continental United States to provide local service and expertise to our customers

Rocklin
2208 Plaza Drive
Suite 100
Rocklin, CA 95765

Chicago
5507 N. Cumberland Avenue
Cumberland Metro Office Park
403
Chicago, IL 60656

Fairport
400 Mason Road
Township of Perinton
Fairport, NY 14450

Syracuse
200 Gateway Park Drive
Syracuse, NY 13212

Ballston Lake
3 Rosell Drive
Ballston, NY 12019

Orange
333 S. Anita Drive
Suite 825
Orange, CA 92868

Irving
1333 Corporate Drive
Suite 315
Irving, TX 75038

Nashville
2525 Perimeter Place Drive
Greenbriar Business Park
Suite 129
Nashville, TN 37214