



DignityMoves Santa Maria

Solar Microgrid Feasibility Study

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DignityMoves Santa Maria – site plan

DignityMoves
522 LAKESIDE PARKWAY
SANTA MARIA, CA 93454

Gensler

45 Howard Street
San Francisco, CA 94105
United States

Tel. 415.433.7300
Fax. 415.229.4590



- 01 DEMO EXISTING CURB AND RAINFALL PATCH AND REPAIR PARKING REQUIREMENTS.
- 02 REMOVE ALL EXISTING PROVIDER OFFICE, ADMINISTRATION AND SERVICE AREA COVERAGES TO ALL PARCEL TYP.
- 03 REMOVE EXISTING DRIVE.
- 04 REMOVE EXISTING DRIVE.
- 05 REMOVE EXISTING DRIVE.
- 06 DEMO EXISTING CHAIN LINK FENCE AND VESTIBULE TO EXISTING BUILDING.
- 07 EXISTING DRIVE INLET REPAIR & DRIVEWAY.

CONSTRUCTION NOTES

- A. SEE AS SHEET SERIES FOR SYMBOLS, DIMENSIONS, GENERAL NOTES & TYPICAL MOUNTING LOCATIONS, HEIGHTS AND ADJUSTMENTS.
- B. GO TO THE LIMITS OF CONSTRUCTION SCOPE WITH NEW CONSTRUCTION SCOPE PRIOR TO COMMENCING WORK.
- C. SEE CONSULTANT AND VENDOR DRAWINGS FOR RELATED SCOPE OF WORK AND COORDINATION PRECEDENCE ON LOCATION OF SERVICES.
- D. CONTRACTOR SHALL PROVIDE SCHEDULABLE SCHEDULING FOR ALL WALL MOUNTED EQUIPMENT WHERE REQUIRED BY THE WORK.
- E. ALL DIMENSIONS ARE BASED OFF OF THE FACE OF THE MEMBER UNLESS NOTED OTHERWISE.
- F. ALL DIMENSIONS SHALL BE ALIGNED TO THE FACE UNLESS NOTED OTHERWISE.
- G. ALL DIMENSIONS SHALL BE ALIGNED TO THE FACE UNLESS NOTED OTHERWISE.
- H. ALL DIMENSIONS SHALL BE ALIGNED TO THE FACE UNLESS NOTED OTHERWISE.
- I. ALL DIMENSIONS SHALL BE ALIGNED TO THE FACE UNLESS NOTED OTHERWISE.
- J. ALL DIMENSIONS SHALL BE ALIGNED TO THE FACE UNLESS NOTED OTHERWISE.
- K. ALL DIMENSIONS SHALL BE ALIGNED TO THE FACE UNLESS NOTED OTHERWISE.
- L. ALL DIMENSIONS SHALL BE ALIGNED TO THE FACE UNLESS NOTED OTHERWISE.
- M. ALL DIMENSIONS SHALL BE ALIGNED TO THE FACE UNLESS NOTED OTHERWISE.
- N. ALL DIMENSIONS SHALL BE ALIGNED TO THE FACE UNLESS NOTED OTHERWISE.
- O. ALL DIMENSIONS SHALL BE ALIGNED TO THE FACE UNLESS NOTED OTHERWISE.
- P. ALL DIMENSIONS SHALL BE ALIGNED TO THE FACE UNLESS NOTED OTHERWISE.
- Q. ALL DIMENSIONS SHALL BE ALIGNED TO THE FACE UNLESS NOTED OTHERWISE.
- R. ALL DIMENSIONS SHALL BE ALIGNED TO THE FACE UNLESS NOTED OTHERWISE.
- S. ALL DIMENSIONS SHALL BE ALIGNED TO THE FACE UNLESS NOTED OTHERWISE.
- T. ALL DIMENSIONS SHALL BE ALIGNED TO THE FACE UNLESS NOTED OTHERWISE.
- U. ALL DIMENSIONS SHALL BE ALIGNED TO THE FACE UNLESS NOTED OTHERWISE.
- V. ALL DIMENSIONS SHALL BE ALIGNED TO THE FACE UNLESS NOTED OTHERWISE.
- W. ALL DIMENSIONS SHALL BE ALIGNED TO THE FACE UNLESS NOTED OTHERWISE.
- X. ALL DIMENSIONS SHALL BE ALIGNED TO THE FACE UNLESS NOTED OTHERWISE.
- Y. ALL DIMENSIONS SHALL BE ALIGNED TO THE FACE UNLESS NOTED OTHERWISE.
- Z. ALL DIMENSIONS SHALL BE ALIGNED TO THE FACE UNLESS NOTED OTHERWISE.

- LEGEND**
- AREA TO REMAIN
 - CONSTRUCTION TO REMAIN
 - FLOOR & FRAME TO REMAIN
 - PAINT/FINISH TYPE TAG REF AS-1
 - ALUMINUMATED CONSTRUCTION
 - NO DOOR & FRAME
 - PROVISION ACCESSIBLE PATH
 - FIRE EXTINGUISHER CABINET
 - FIRE EXTINGUISHER
 - FLOOR TYPE TAG SEE AS-10
 - ACCESSIBLE PATH OF TRAVEL
 - REF. FLOOR PRELAP QUESTION #1.

Signature

NOT FOR CONSTRUCTION

Project Name:
522 LAKESIDE PARKWAY

Project Number:
01.2216.000

Description:
CONSTRUCTION PLAN

Scale:
AS INDICATED

A01.01

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1 CONSTRUCTION PLAN - SANTA MARIA BETTERAVIA
SCALE: 1/8" = 1'-0"

11/2022 CLEAN COALITION | 45 HOWARD STREET, SAN FRANCISCO, CA 94105 | TEL: 415.433.7300 | WWW.CLEANCOALITION.ORG

DignityMoves Santa Maria – example units



Cube144 – 8.5' x 17' Two Room
MODEL # BCULT08517GN000



Temporary “pop-up” housing unit examples for the Santa Maria site.



BOSS CUBEZ TEMPORARY
SINGLES ADA EN SUITE



TECHNICAL SUPPLIES & SERVICES CO., LLC
P.O. BOX 77501 DUBAI U.A.E.
TEL: (04) 88551611 FAX: (04) 88551413
email: info@tssuae.com
website: www.tssuae.com

LIFEARK HOUSING TYPES

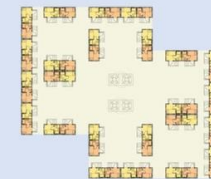


1.5 MODULE 100 SF SHELTER FOR FAMILY

- 3 X 1 DOUBLE FAMILY SHELTER UNIT
- PRIVATE LOCKABLE BEDROOM UNIT
- PRIVATE BATHROOM
- LIGHTING AND POWER OUTLET
- AIR CONDITIONER/ HEATER
- FIRE SPRINKLER
- COMMUNITY CLUSTERING



1.5 MODULE SHELTER UNIT



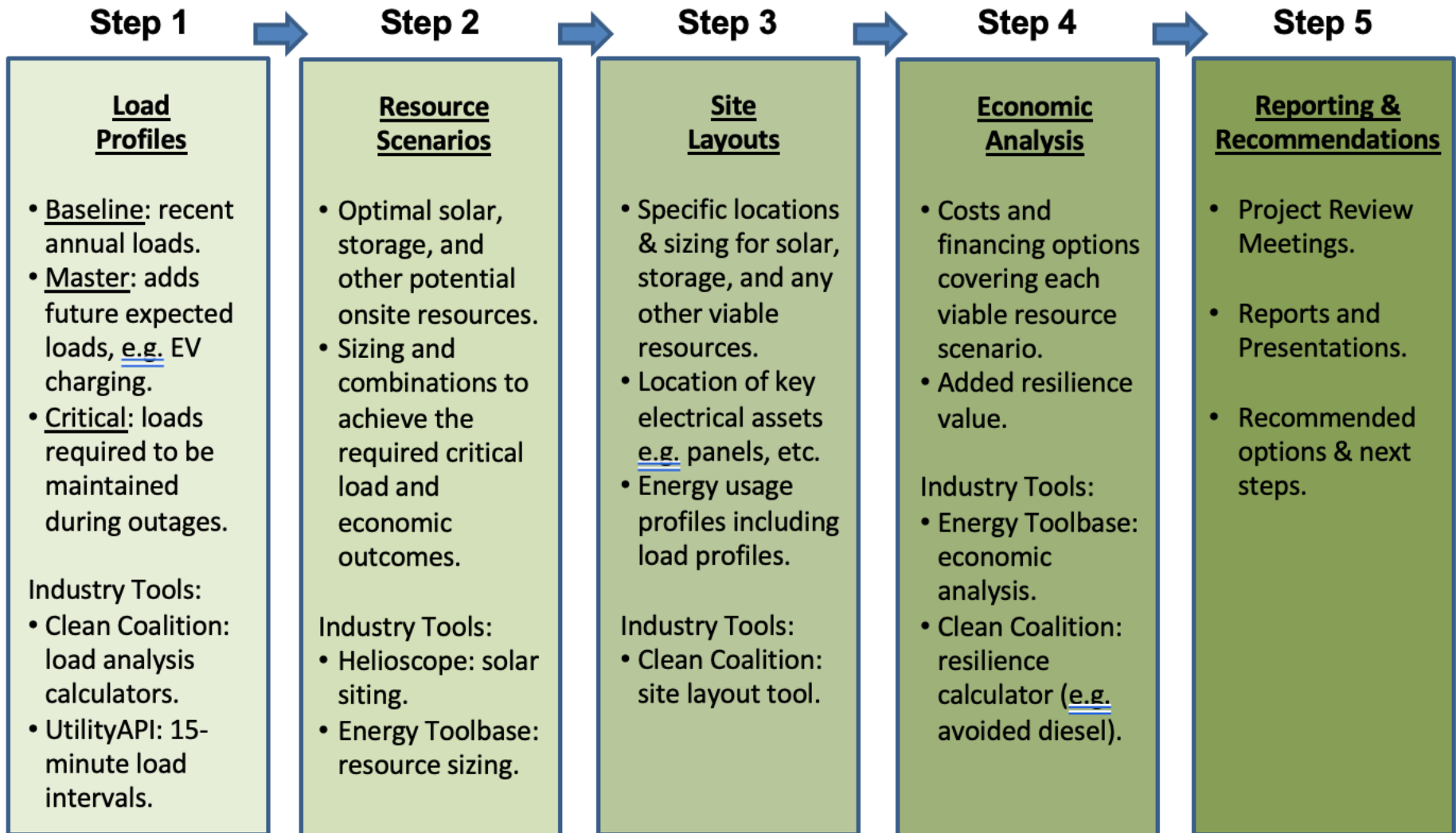
48 UNIT COMMUNITY CLUSTER



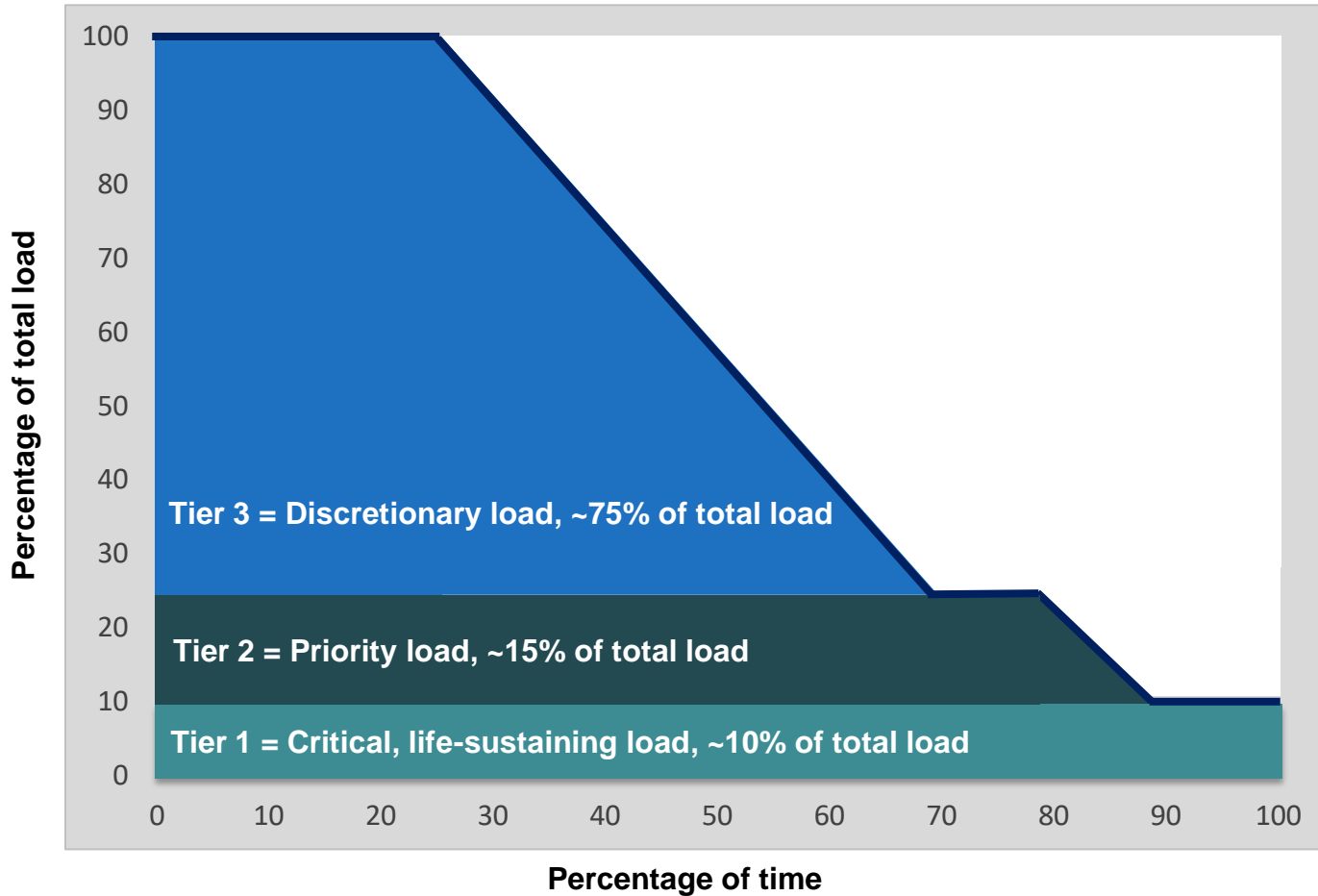
Optimize the DER mix to achieve the following outcomes:

1. Serve all energy needs for a 100% electric community design until the electricity utility (PG&E) can establish service.
2. Achieve net zero energy.
3. Maintain Tier 1 (critical) loads during grid outages of any duration.
4. Support Tier 2 (priority) loads for the majority of time and Tier 3 (discretionary) loads for significant percentages of time.
5. Preempt the use of diesel and any other fossil fuels.
6. Standardize the Solar Microgrid components for ongoing use via Solar Microgrid kits for modular units.
7. Maximize economic benefits.

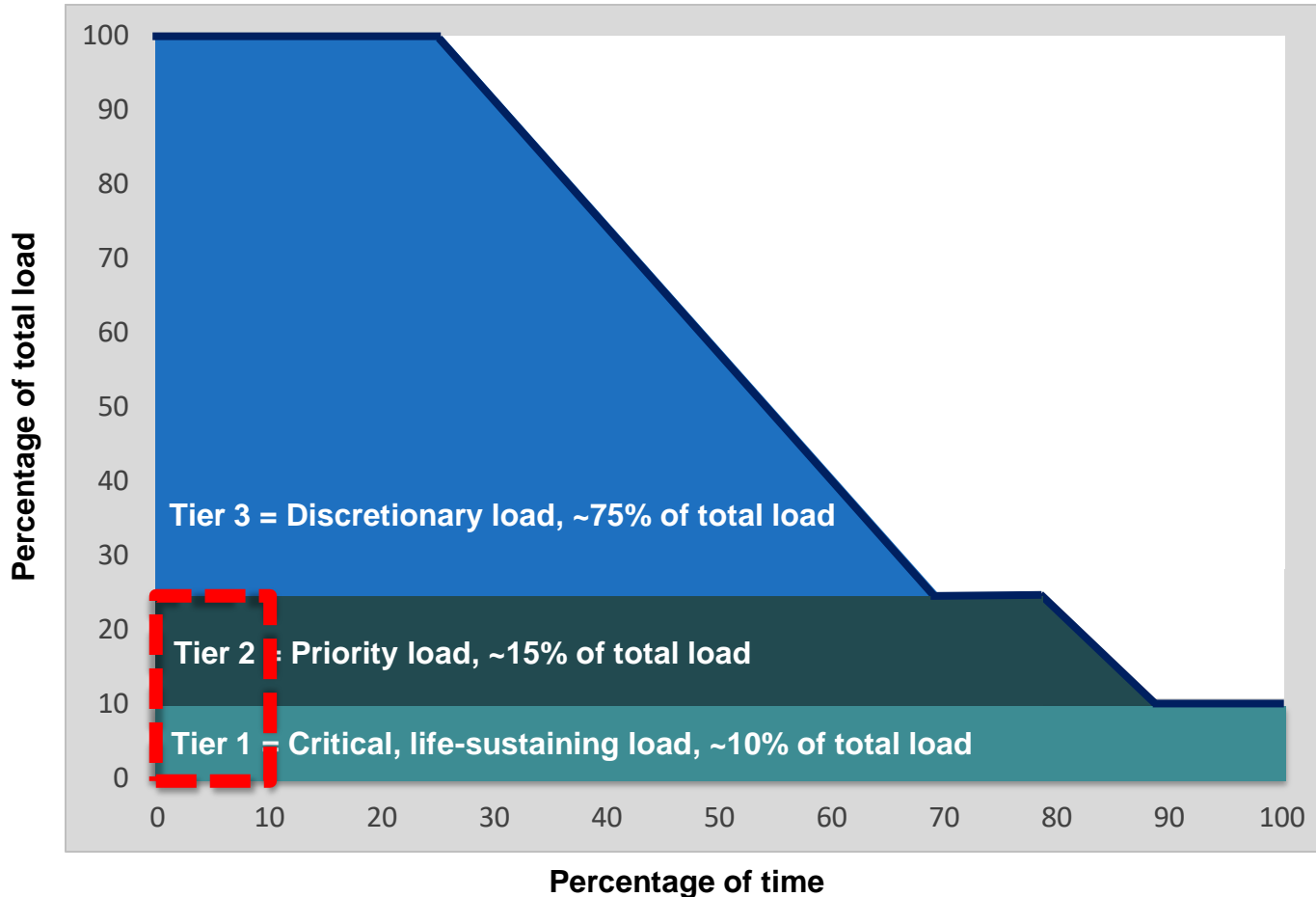
Solar Microgrid Methodology steps



Load Profiles



Percentage of time online for Tier 1, 2, and 3 loads for a Solar Microgrid designed for the University of California Santa Barbara (UCSB) with enough solar to achieve net zero and 200 kWh of energy storage per 100 kW solar.



A typical diesel generator is configured to maintain 25% of the normal load for two days. If diesel fuel cannot be resupplied within two days, these loads go off – hardly a solution for increasingly necessary long-term resilience. In California, Solar Microgrids provide a vastly superior trifecta of economic, environmental, and resilience benefits.

Load tiering based on plans & modifications

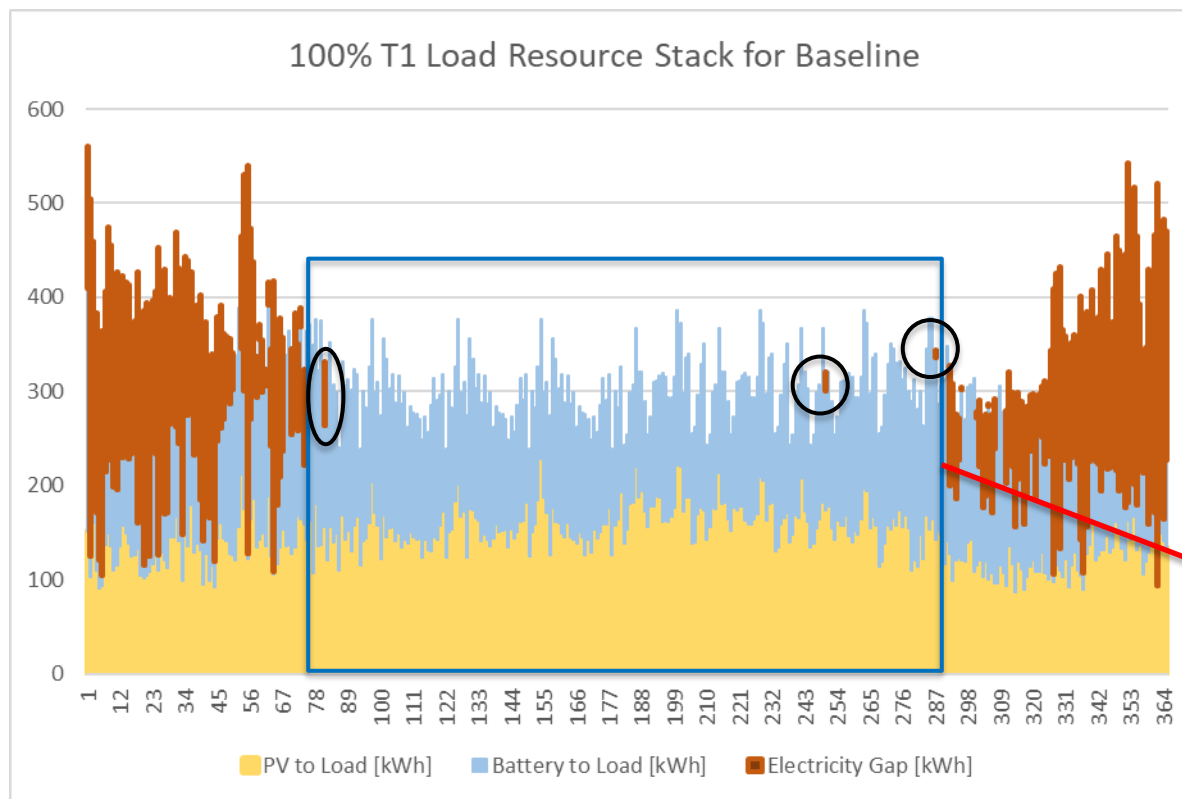
Electrical Panels and Loads				Watts (VA)	Percentage of Total Load	Percentage of T1 Load	Tier 1	Tier 2	Tier 3	
MSB	CDP1	Falcon PNL A	Food SVC Module FS-1	29,952	5.25%		X			
			Food SVC Module FS-2	27,248	4.78%			X		
			Food SVC Module FS-3	Refrigerator	12,272	2.15%	18.8%	X		
				Microwave (Prep - CTR RH)						
				Microwave (Prep - CTR LH)						
				Conven Outlet (Prep - LH)						
				General LTS & Vent Fan						
				Conven Outlet (Flex - Rear wall)						
				Campus Lighting (exerior)						
				Conven Outlet (exterior)						
				Microwave (Prep - LH)						
				Air Conditioning (x2)						
				Conven Outlet (IT RM - LH wall)						
				Conven Outlet (IT RM - Entry & RH)						
	Conven Outlet (IT RM - Server LWR)									
	Conven Outlet (IT RM - Server UPR)									
	Conven Outlet (IT RM - Rear Wall)									
	Microwave (Prep Area - RH)									
	Module Laundry	24,274	4.26%					X		
	Storage - North	2,080	0.36%					X		
	Community Bldg PNL	7,904	1.39%	12.1%		X				
	Module 24/TS-1L - Bathrooms	6,448	1.13%	9.9%		X				
	Module 24/TS-1R - Bathrooms	6,448	1.13%							
	Module Restroom	5,616	0.98%	8.6%		X				
	Intake/Security Lights	84	0.01%	0.1%		x				
	Exterior Lights	138	0.02%	0.2%		x				
	Intake Reception Room	360	0.06%	0.6%		x				
Security Rec	360	0.06%	0.6%		X					
Packaged Terminal Air Conditioner (PTAC)	2,304	0.40%				x				
Falcon PNL B (North Support Services)	Offices/Staff Break Lights	147	0.03%					x		
	Exterior Lights (3 brkrs)	345	0.06%	0.5%		x				
	Flex (multipurpose) Office Reception (3 brkrs)	2,160	0.38%					x		
	Staff Break Reception	540	0.09%				x			
	Nurse Medical Reception	720	0.13%				x			
	Packaged Terminal Air Conditioner (PTAC)	9,216	1.62%					x		
	Offices Lights	84	0.01%				x			
	Offices/Nurse/Medical Lights	147	0.03%	0.2%		x				
	IWH - 1 (2 units)	12,480	2.19%				X			
	Medical Fridge	1,200	0.21%	1.8%		x				
	Refrigerator	1,200	0.21%				X			
	Disposal	1,200	0.21%					x		
	Coffee Maker	1,200	0.21%					x		
Microwave	1,200	0.21%				x				
Falcon PNL C (South Support Services)	Offices/Meeting Lights	147	0.03%					x		
	Exterior Lights	483	0.08%	0.7%						
	Flex (multipurpose) Office Reception	2,160	0.38%					x		
	Meeting Reception Room	1,440	0.25%					x		
	Lounge Reception (Family room for managing families)	1,080	0.19%				x			
	Microwave	1,200	0.21%					x		
	Coffee Maker	1,200	0.21%					x		
	IWH-1	6,240	1.09%				X			
	Disposal	864	0.15%					x		
	Office Lights	84	0.01%					x		
	Lounge /Offices/Meeting Lights	273	0.05%					x		
	Packaged Terminal Air Conditioner (PTAC)	11,520	2.02%					x		
	RDP1	Module Panel - Single Family Unit 1, 7	35,360	6.20%					X	
Module Panel - Two Family Unit 2, 3, 4, 5, 6		95,470	16.74%					X		
Electrical Vehicle Charging Station - 1, 2		13,312	2.33%					X		
Reception - Main Service Area		180	0.03%	0.3%		X				
Storage South		8,320	1.46%					X		
Parking Lot Lights		237	0.04%	0.4%		X				
DP2	4 Bed Unit 1,2,3,4,5,6,7,8,9,10,11	116,688	20.46%					X		
DP3	4 Bed Unit 12,13,14,15,16,17,18,19,20,21,22	116,688	20.46%					X		

Legend
X: Clean Coalition choice based on prior experience
x: DignityMoves original choice

Resource Scenarios and Site Layout

DignityMoves SM – Battery sizing (2 BESS) with solar on Boss Cubez units

DignityMoves Santa Maria - On-Grid HomeGrid Battery Energy Storage Sizing, System Cost, and Resilience							
Baseline Load Profile Peak Demand (kW)	Solar System Size (kW)	Recommended Battery System Size		Battery System Cost		Indefinite Resilience	
		Standard Option Battery Power Capacity (kW)	Standard Option Battery Energy Capacity (kWh)	Total Battery Energy Storage System Cost	Battery Energy Storage System Cost per kWh	Total Percentage of Load Kept Online Indefinitely (Year 1)	Total Percentage of Load Kept Online Indefinitely (Year 15 - before replacement)
41	86.4	150	307	\$269,717	\$878	40.0%	35.0%



The total annual energy gap is 22,159 kWh. When on-grid, this energy gap is supplied by the grid. When off-grid, this energy gap would require 1,773 gallons of diesel fuel for 1 year – see diesel generator details in next slide.

For mid-March through October, solar and storage should be enough to cover 100% of the site’s electrical load, except for the following three days:

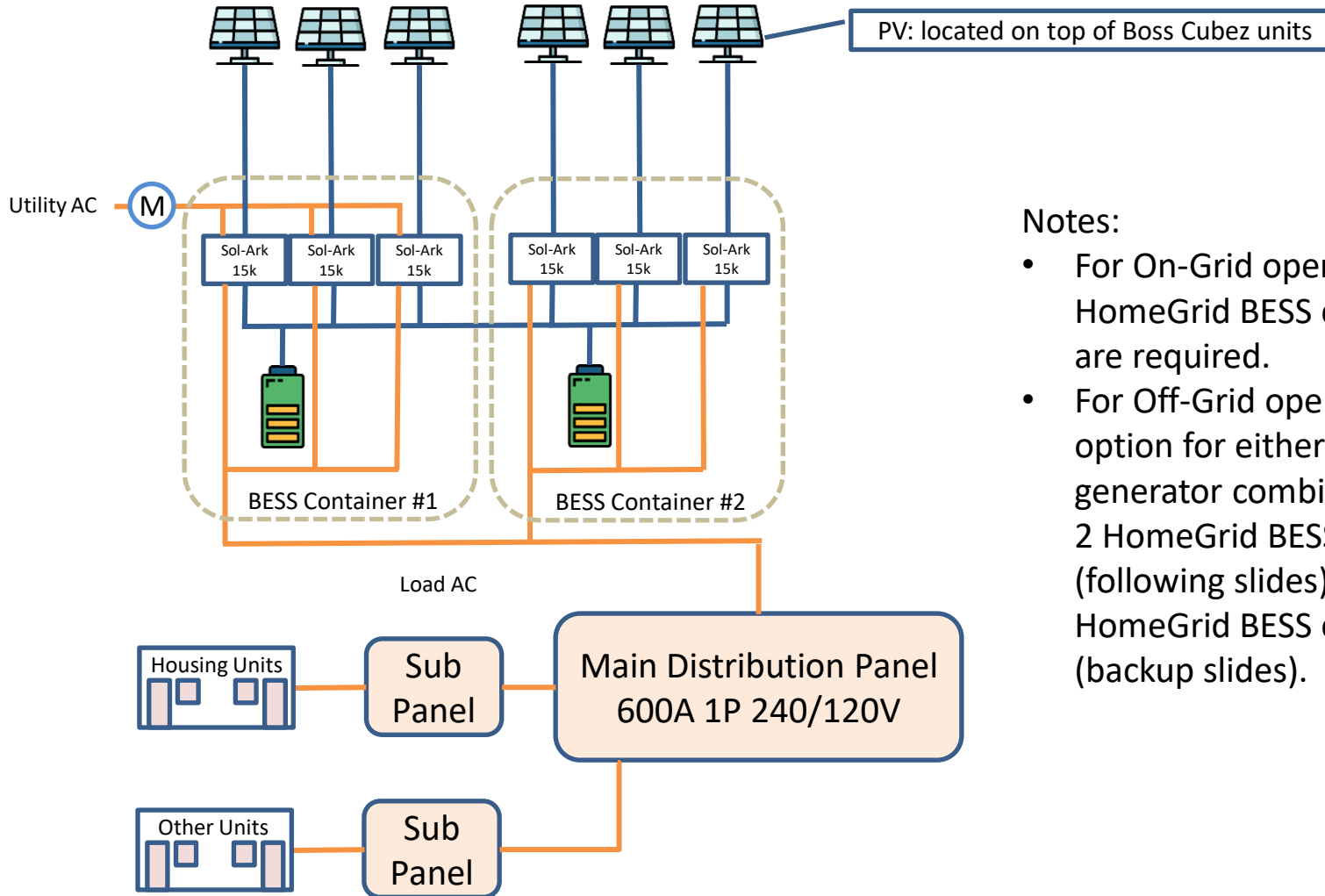
- Date – 22 March (67 kWh)
- Date – 7 September (20 kWh)
- Date – 14 October (8 kWh)

DignityMoves SM – example solar layout with 86 kWdc (114% NZE) via 216 (400W) solar panels



DignityMoves Santa Maria - Boss Cubez Total Solar Siting Potential					
Solar Siting by Location	Baseline Annual Load (kWh)	Solar System Size (kWdc)	Number of 400W Qcells Panels	Annual Solar Generation (kWh)	Solar Siting Potential as a Percentage of Net Zero
(29) Cube 144 - 2 rooms each for residences & offices	Not Calculated	46	116	74,702	61%
(16) Cube 170 - 2 rooms each for couples/ADA residences	Not Calculated	32	80	51,519	42%
(2) Cube 288 - 1 room each for dining & flex	Not Calculated	6	16	10,304	8%
(1) Cube 144 - 1 room for clinic	Not Calculated	2	4	2,576	2%
Total	121,899	86	216	139,100	114%

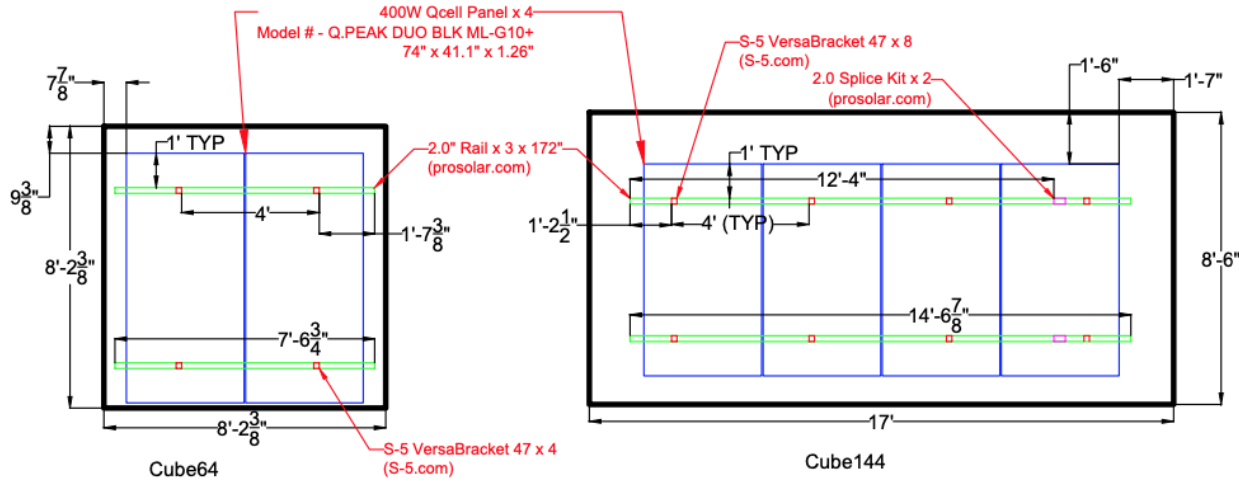
DignityMoves SM – System diagram



Notes:

- For On-Grid operations, 2 HomeGrid BESS containers are required.
- For Off-Grid operations, option for either a diesel generator combined with the 2 HomeGrid BESS containers (following slides), or 4 HomeGrid BESS containers (backup slides).

Boss Cabez - Cube64, Cube 144 Roof PV Layouts



General Notes:

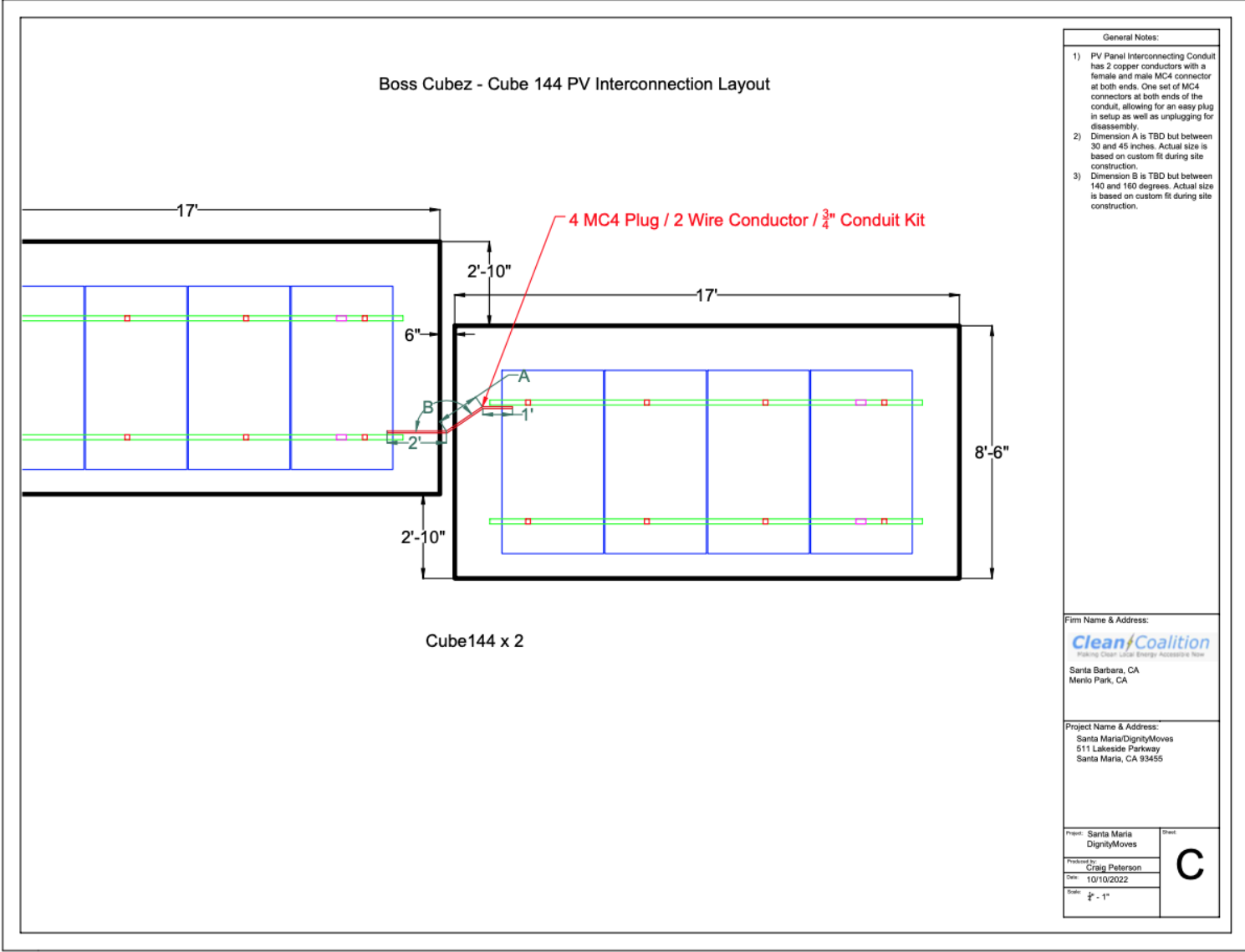
Firm Name & Address:

Clean Coalition
 Santa Barbara, CA
 Merito Park, CA

Project Name & Address:

Santa Maria/DignityMoves
 511 Lakeside Parkway
 Santa Maria, CA 93455

Project:	Santa Maria DignityMoves	Sheet:	A
Prepared by:	Craig Paterson		
Date:	8/22/2022		
Scale:	1:50		



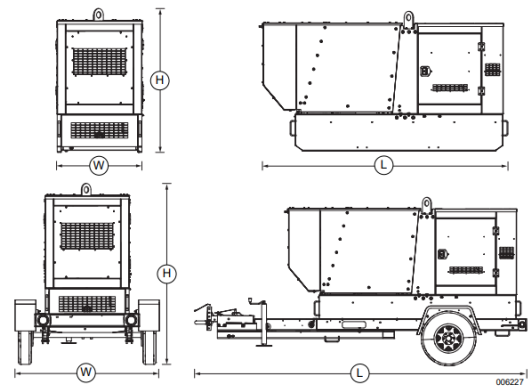
DignityMoves Santa Maria - Diesel Sizing and Resilience						
Annual Load (kWh)	Total 1-Year Energy Gap (kWh)	Diesel Required for 1-Year Energy Gap (gallons)	Max Daily Fuel Needed (gallons)	Average Daily Fuel Needed (gallons)	Diesel Genset Size (kW)	Genset Tank Capacity (gallons)
121,899	22,159	1,773	34	13	60	146

Diesel Generator Estimated System Cost & O&M - 60 kW / 146 gallons		
Company	Diesel Generator Scope of Work	Costs
Diesel Generator Supplier	Generator and Fuel Tank - Total Equipment Cost	\$55,514
Diesel Generator Supplier	Tax and Shipping	\$4,608
Diesel Generator Supplier	Generator Maintenance (\$/Year)	\$2,600
Diesel Generator Supplier	Fuel Cost (\$/Year) for energy gap of 22,159 kWh	\$11,523
	Total	\$74,245

* NOTE: the diesel fuel cost covers a maximum of 1 year, as the projected energy gap for that timeframe.

DIMENSIONS AND WEIGHTS*

Diesel Generator dimensions with trailer: 14.2 x 5.8 x 6.7 ft.



	Runtime: hr*	Usable Fuel Capacity: gal (L)	Dimensions – LxWxH: in (m)	Weight: lb (kg)
Skid	39	146 (552)	119 (3.02) x 40 (1.02) x 62 (1.57)	Dry: 3,830 (1,740) Operating: 4,790 (2,170)
Trailer	39	146 (552)	170 (4.31) x 69 (1.75) x 80 (2.03)	Dry: 4,530 (2050) Operating: 5,490 (2,490)

* Runtime based on 75% prime rated power.



Economic Analysis

DignityMoves SM – Breakdown of PV and battery system costs (2 BESS)

DignityMoves Santa Maria - Off-Grid System Costs		
Solar System Size - 86.4 kWdc		
Company	Solar Scope of Work	Costs
Sun Pacific Solar Electric	Solar Panels and Installation	\$238,000
Solar Cost per Wdc		\$2.75
Battery Energy Storage System - 150 kW / 307.2 kWh		
Company	Battery Scope of Work	Costs
HomeGrid	Shipping	\$2,709
HomeGrid	Batteries	\$133,168
HomeGrid	Containers with 3 Sol-Ark Inverters	\$71,840
Sun Pacific Solar Electric	Permitting	\$3,000
Sun Pacific Solar Electric	Site Prep	\$25,000
Sun Pacific Solar Electric	Battery Installation	\$4,000
Sun Pacific Solar Electric	Schneider Smart Main Service Board	\$30,000
Total		\$269,717
Battery Energy Storage System Cost Per kWh		\$878
Grand Total		\$507,717

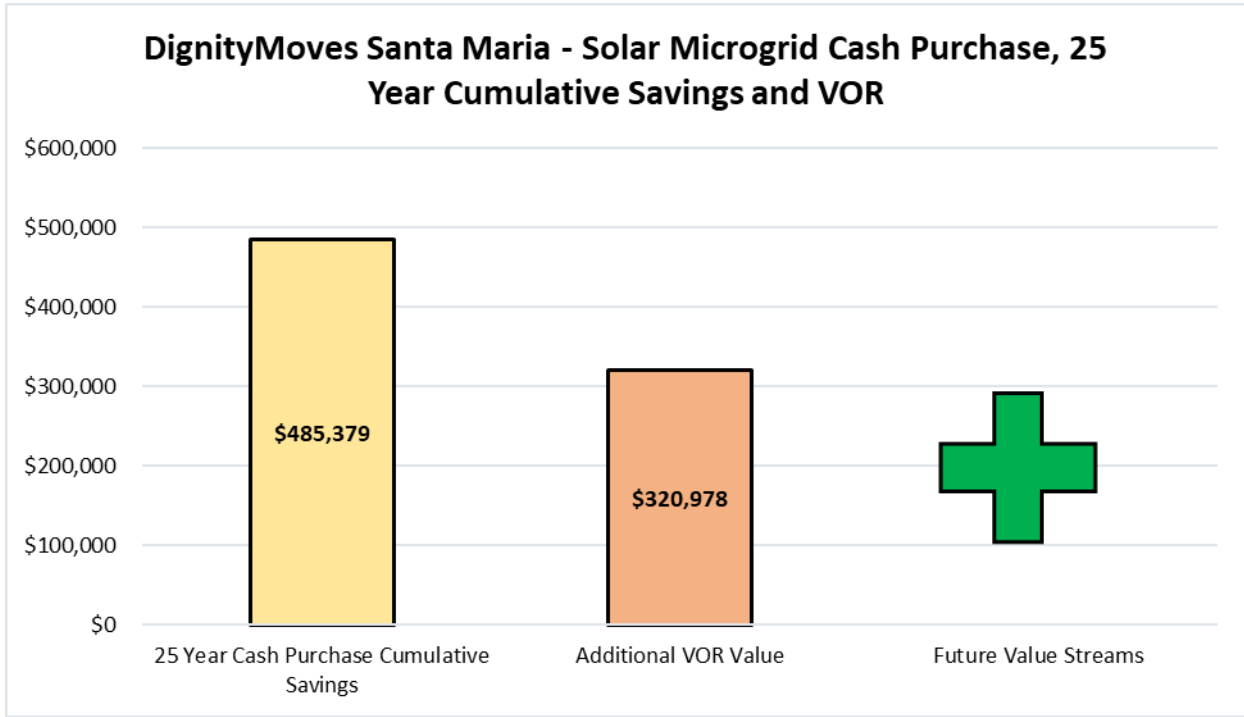
DignityMoves Santa Maria - Annual System Operations and Maintenance (O&M)		
Company	O&M Scope of Work	Costs
Sun Pacific Solar Electric	Battery Remote Review and Testing	\$5,000
Sun Pacific Solar Electric	Solar Panel Cleaning	\$1,800
Total		\$6,800
Cost Per Wdc		\$0.0787

DignityMoves SM – 25 Year Solar Microgrid cash purchase key economic details (2 BESS)



DignityMoves Santa Maria - 25 Year Cash Purchase Economic Details								
Facility	Annual Electricity Bill Cost (Pre-Solar Microgrid)	Solar Microgrid Cash Purchase - 25 Year Costs and Savings						Value of Resilience
		Capital Expenditure (Capex)	Operational Expenditure (Opex)	Incentives	Net Total Project Cost	Cumulative Utility Bill Savings	Net Cumulative Savings	25 Year Value
Santa Maria	\$35,215	(\$507,317)	(\$424,676)	\$253,659	(\$678,334)	\$1,163,713	\$485,379	\$320,978

- Uses the scenario of 68.4 kW of solar and 150 kW / 307 kWh of energy storage
- Cash purchase economics use a 3% annual utility escalator, 30% ITC Direct Pay with a 20% low-income community & economic benefit project adders.

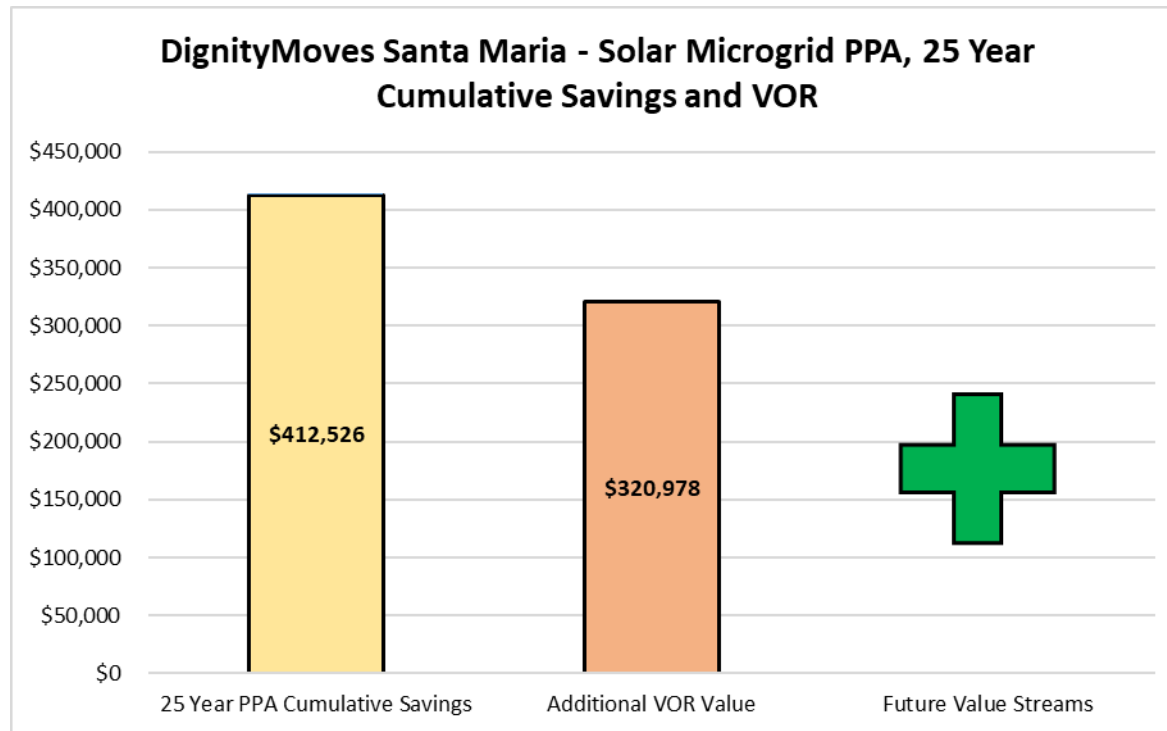


DignityMoves SM – 25 Year fixed PPA key economic details (2 BESS)

DignityMoves Santa Maria - 25 Year PPA Economic Details

Facility	Annual Electricity Bill Cost (Pre-Solar Microgrid)	Solar Microgrid 23¢/kWh PPA - 25 Year Costs and Savings					Value of Resilience
		Average Monthly PPA Payment	25 Year Total PPA Payments	Cumulative Utility Bill Savings	Net Cumulative Savings	Year 1 Savings	25 Year Value
Santa Maria	\$35,215	(\$2,504)	(\$751,187)	\$1,163,713	\$412,526	\$2,339	\$320,978

- Uses the scenario of 68.4 kW of solar, and 150 kW / 307 kWh of energy storage.



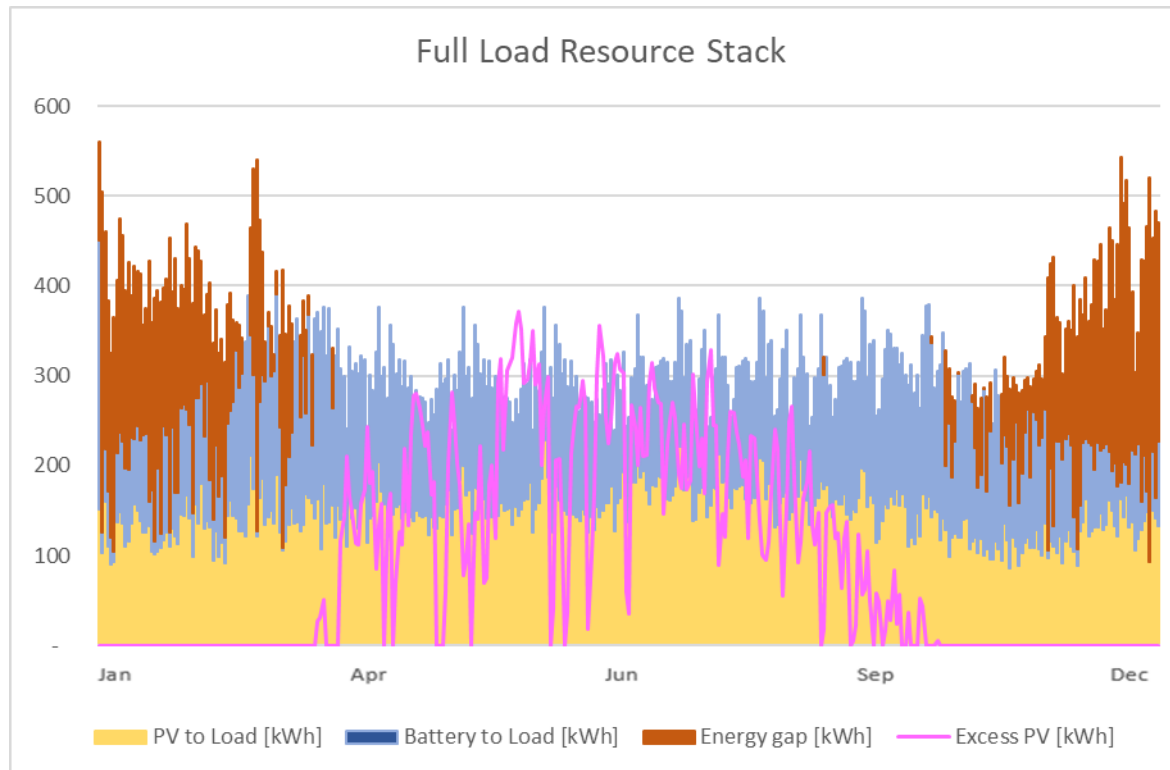
Additional Resource Scenarios

DignityMoves SM – Battery sizing (2 BESS) with solar on Boss Cubez units – Excess solar



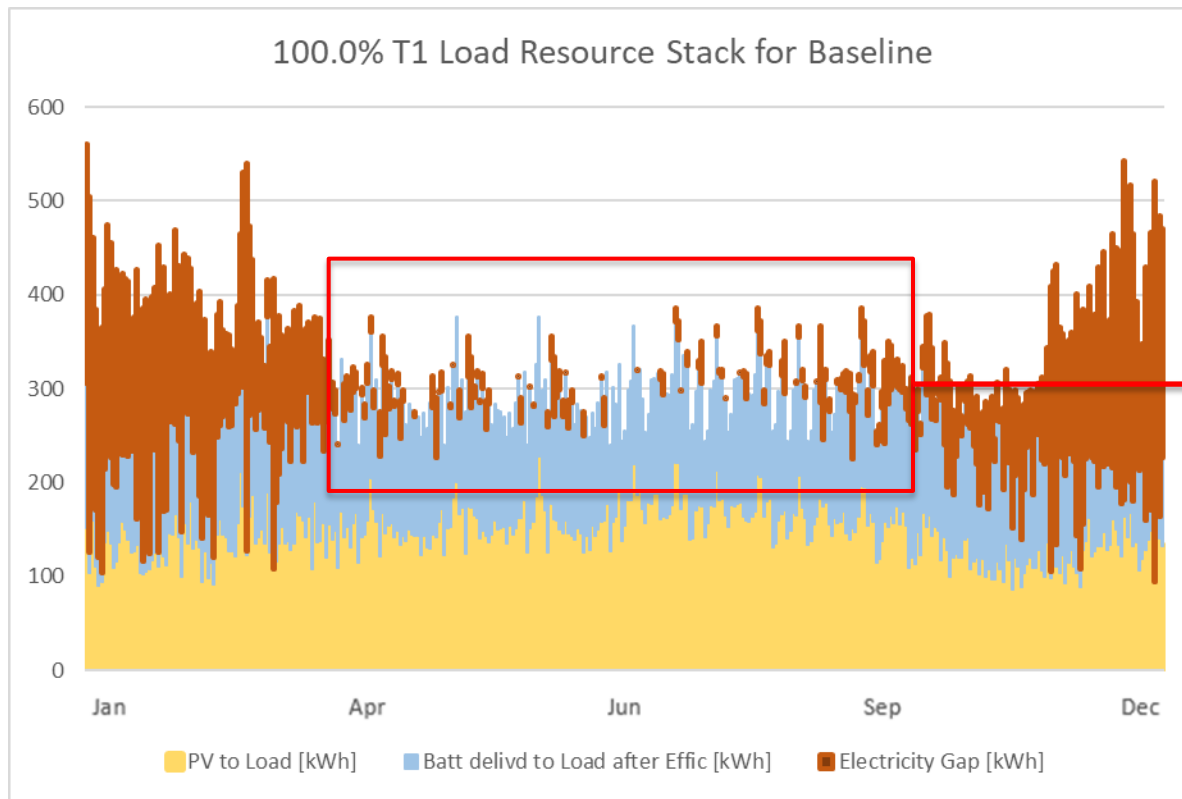
DignityMoves Santa Maria - On-Grid HomeGrid Battery Energy Storage Sizing, System Cost, and Resilience

Baseline Load Profile Peak Demand (kW)	Solar System Size (kW)	Recommended Battery System Size		Battery System Cost		Indefinite Resilience	
		Standard Option Battery Power Capacity (kW)	Standard Option Battery Energy Capacity (kWh)	Total Battery Energy Storage System Cost	Battery Energy Storage System Cost per kWh	Total Percentage of Load Kept Online Indefinitely (Year 1)	Total Percentage of Load Kept Online Indefinitely (Year 15 - before replacement)
41	86.4	150	307	\$269,717	\$878	40.0%	35.0%



DignityMoves SM – Battery sizing for on-grid (1 BESS) with solar on Boss Cubez units

DignityMoves Santa Maria - On-Grid HomeGrid Battery Energy Storage Sizing, System Cost, and Resilience							
Baseline Load Profile Peak Demand (kW)	Solar System Size (kW)	Recommended Battery System Size		Battery System Cost		Indefinite Resilience	
		Standard Option Battery Power Capacity (kW)	Standard Option Battery Energy Capacity (kWh)	Total Battery Energy Storage System Cost	Battery Energy Storage System Cost per kWh	Total Percentage of Load Kept Online Indefinitely (Year 1)	Total Percentage of Load Kept Online Indefinitely (Year 15 - before replacement)
41	86.4	75	154	\$167,213	\$1,089	28.0%	23.0%



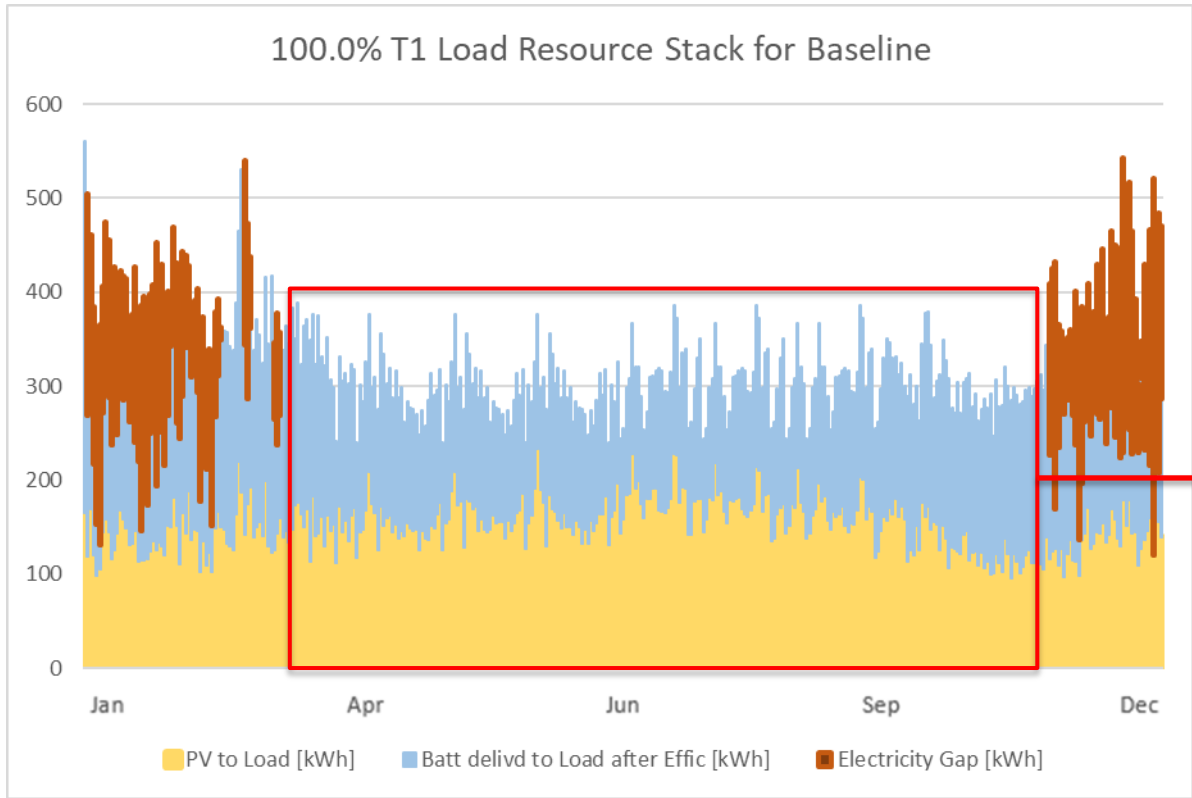
For the months from April to September, there is an electricity shortfall of 2,311 kWh.

The total annual energy shortfall is 27,045 kWh.

DignityMoves SM – Battery sizing for off-grid (4 BESS) with solar on Boss Cubez and LifeArk units



DignityMoves Santa Maria - Off-Grid HomeGrid Battery Energy Storage Sizing, System Cost, and Resilience with Boss Cubz and LifeArk Units							
Baseline Load Profile Peak Demand (kW)	Solar System Size (kW)	Recommended Battery System Size		Battery System Cost		Indefinite Resilience	
		Standard Option Battery Power Capacity (kW)	Standard Option Battery Energy Capacity (kWh)	Total Battery Energy Storage System Cost	Battery Energy Storage System Cost per kWh	Total Percentage of Load Kept Online Indefinitely (Year 1)	Total Percentage of Load Kept Online Indefinitely (Year 15 - before replacement)
41	110.4	300	614	\$474,724	\$773	56.0%	54.0%



For the months from March to November, solar and storage should be enough to cover 100% of the site's electrical load.

The total annual energy shortfall is 13,362 kWh.