Moreno Valley Mall

CIOPROUSA

Date: 9/4/2024

Developer: CIOproUSA

City: Moreno Valley

author: Dr. William Francis

Address: 22500 Town Cir, Moreno Valley, CA 92553

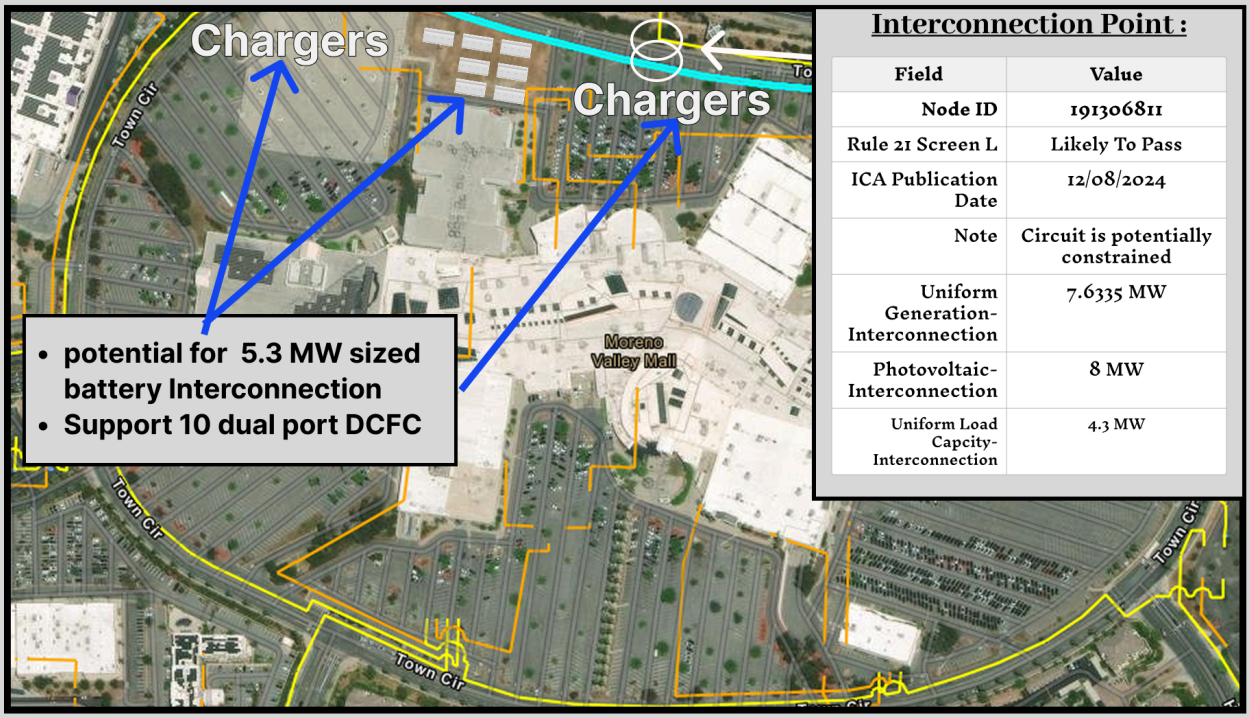
APN: [291110032, 291110036, 291110037, 291110033, 291110034, 291110035]

Suggestion: *For the Moreno Valley Mall property, two battery storage strategies are under evaluation, informed by the available Integration Capacity Analysis (ICA) data from the Duda 12 kV circuit.*

- ***Option 1:*** *proposes a larger, future-ready system designed to serve existing mall operations while enabling future expansion to support up to* ***20 DC fast charging ports****. The system includes* ***nine Powin Stack 800 battery pods****, delivering* ***1.8 MW of discharge capacity*** *and* ***7.2 MWh of storage****, with a design path scalable to* ***5 MW / 20 MWh****. Based on ICA data from Segment ID* ***52253395****, which shows* ***7.63 MW*** *of uniform generation headroom, this option remains feasible with a 30% planning buffer, resulting in a* ***usable interconnection capacity of ~5.3 MW****. This configuration aligns with California's electrification and grid resilience goals, and it is eligible for incentive programs including* ***SGIP, ITCs and potentially more****. However, it requires a larger capital investment and careful interconnection planning.*
- ***Option 2:*** *targets only the mall's current energy needs with no initial EV charging infrastructure. It proposes a smaller configuration using* ***three Powin Stack800 battery pods****, providing* ***600 kW of discharge*** *and* ***2.4 MWh of energy storage*** *for* ***peak shaving, load shifting, and limited backup power****. This system could interconnect through Segment ID* ***52253395*** *or* ***191108865****, both of which have "Likely to Pass" Rule 21 Screen L results. Segment 191108865 offers* ***3.7 MW*** *of ICA generation capacity (or approximately* ***2.6 MW*** *with buffer), making this option suitable for a fast, cost-efficient deployment. However, it offers limited long-term flexibility and would require substantial upgrades to support high-power EV charging in the future.*

The mall spans over ***31 acres****, with* ***430,000+ square feet*** *of retail space, zoned for commercial use and located in a* ***Zone X flood area****, minimizing siting constraints. With existing* ***12 kV infrastructure*** *and "Likely to Pass" results on Rule 21* ***Screen L*** *at both segments, the site is well-positioned for interconnection. A Screen L verification is still recommended to ensure grid compatibility, particularly for the larger option. Overall, the larger system offers greater resilience, future-proofing, and funding potential, while the smaller system offers speed and cost efficiency for near-term backup and load management.*

DCFC and Battery Potential Site Layout



Interconnection Point :

Field	Value
Node ID	191306811
Rule 21 Screen L	Likely To Pass
ICA Publication Date	12/08/2024
Note	Circuit is potentially constrained
Uniform Generation-Interconnection	7.6335 MW
Photovoltaic-Interconnection	8 MW
Uniform Load Capcity-Interconnection	4.3 MW

Charging Station Plan – Option 1: Future-Ready Deployment with Titan V4:

System Components		
Battery Count	**Battery Size**	**kwh**
9	800 kwh per	7,200
EV Chargers	**Ports**	**Power(kw)**
10	20	2000-3000

As part of Option 1, the EV Charging Station will be developed with a future-ready infrastructure, supporting both current mall operations and anticipated high-demand EV charging needs. The initial deployment includes **10 Titan V4 high-power DC fast chargers**, totaling **20 ports**, each capable of delivering **between 120kW-160kw per port** with dynamic power distribution. These chargers are equipped with CCS-2 connectors and support flexible load balancing to reduce grid strain during peak periods.

To support energy delivery and mitigate demand charges, the system includes **nine Powin Stack 800 battery pods**, offering **1.8 MW of discharge capacity** and **7.2 MWh of energy storage**. This configuration allows for **peak shaving**, **grid flexibility**, and **backup support**, while remaining within Rule 21 interconnection limits (estimated ICA-buffered load capacity ~3 MW).

Charging Station Plan – Option 2: Battery-Only Resilience Deployment with Powin Pods

System Components		
Battery Count	**Battery Size**	**kwh**
3 Powin Pod	800 kwh per	2,400

Option 2 offers a streamlined, charger-free configuration focused on grid resilience, energy cost reduction, and operational flexibility. It consists of **three Powin Stack 800 battery pods**, providing 8**00 kW of discharge capacity** and **2.4 MWh of energy storage**.

With minimal interconnection complexity and a smaller physical and regulatory footprint, Option 2 is optimized for fast deployment and qualifies for **resilience-focused incentives** under SGIP and IRA. It is ideal for facilities seeking backup capacity and demand charge mitigation.

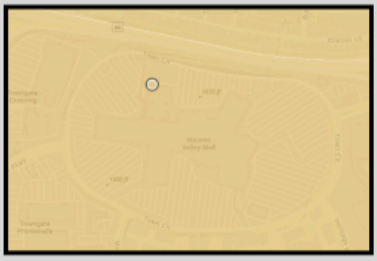
EV Battery Storage Analysis

This table summarizes various battery configurations for a 10-charger EV installation. It includes the total battery size (in kWh), the average daily charging duration (in hours), and the percentage of energy that must be supplied by the grid after battery discharge. The scenarios help evaluate how different battery sizes affect grid dependency and charging performance.

Battery Size (kWh)	Average Usage (Hours)	Grid Energy % Needed
12,000	1.7	0.0127
20,000	1.7	0.0000
8,000	1.7	0.0330
16,000	1.7	0.0006
8,000	1.7	0.0335
12,000	2.82	0.0395
8,000	2.82	0.0641
20,000	2.82	0.0133
16,000	2.82	0.0298
8,000	2.82	0.0641
12,000	4.73	0.0648
8,000	4.73	0.2774
16,000	4.73	0.0598
20,000	4.73	0.0440
8,000	4.73	0.2744

This analysis suggests the 1.8MW/7.2MWH setting which is more comparable to the 8,000 kwh scenario is sufficient for the 10 chargers

Tax Credits & Grants



Eligible for 30C Tax Credit until 2029

Low Income Community Eligibility: Blue implies eligibile

In an Eligible Energy Community

In a Eligible Opportunity Zone

	Investment Tax Credit	Production Tax Credit(cents per kwh)
Alternative refueling (30C)Base Credit:	30%	2.75
Renewable Systems (48E)Base Credit:	30%	2.75
Domestic Content Bonus:	10%	0.3
Energy Community Bonus:	10%	0.3
Low-Income Community:	10%	

The project site qualifies for a powerful stack of federal tax incentives under the Inflation Reduction Act (IRA), significantly improving project economics. It is eligible for the **30% Investment Tax Credit (ITC)** under both Section 30C (EV charging) and Section 48E (battery storage), and it falls within a **designated Energy Community**, a **Low-Income Community**, and an **Opportunity Zone**. These designations unlock additional ITC bonuses of **10% each** for energy communities and low-income areas, with an additional **10% bonus** if domestic content requirements are met. Altogether, the project could receive **up to 50–60% total ITC** on qualifying costs, dramatically reducing capital expenditure for both the battery system and EV infrastructure.

Interconnection Point and Distribution Networks Information

Circuit Level		
	Segment ID: 52253395	**Segment ID: 191108865**
Distribution Circuit Name	Duda	Duda
Node ID	191306811	191108844
Rule 21 Screen L	Likely to Pass	Likely to Pass
Constraint Note	Circuit is potentially constrained	
ICA Publication Date	12/08/2024	12/08/2024
Uniform Generation Capacity	7.6335 MW	3.695 MW
Photovoltaic Capacity	8 MW	4 MW
Uniform Load Capacity	4.3 MW	2.55 MW
Circuit Voltage	12 kV	12 kV

Substation Level		
Substation Name	Maxwell	
Substation ID	1690	
System Name	Vista 220/115 System	
Existing Generation (MW)	18.65	
Queued Generation (MW)	1.91	
Total Generation (MW)	20.55	

Major System Components

Battery Energy Storage System: Powin 800 Stack		
System Duration:	4hrs	
Battery Size Min(MWh):	1MW(4MWh)	No Chargers
Battery Size Max(MWh):	3MW(12MWh)	10 dual port fast Chargers
Price Per MWh:	approx 300,000 USD	Based on Powin 120 MWh Quote
DC Scope	DC Stacks + Enclosure	
AC Scope	PCS + MV Transformer	Power conversion system with medium voltage transformers
Charge Type:	Asymmetric	Does not need to fully charge

Charger System: Titan V4 – StarCharge	
Number of Chargers	*10(option 1)*
Maximum Power	240–320 kW (modular in 40 kW steps)
Output Voltage	150–1000 VDC
Input Voltage	400 VAC ±15%, 3-phase, 50/60Hz
Does it have Parallel Mode	Yes – dynamic power distribution across connectors
Charger Dimensions	800×2050×750 mm (standard) or 1259×2225×800 mm (with cable management system)
Total Power Output	Up to 320 kW per unit; 300 A rated, 500 A max (10 min) per connector
Internet Connection	OCPP 1.6J (OCPP 2.0 ready), remote diagnostics, service assignment via app

Capital Expenditures

Option 1

Component	Count	Size	Total
Battery System	9	1.8 MW / 7.2 MWh	$1,980,000
Inverter	13	166 kW AC, 1500V DC	$237,250
Transformer	1	5 MVA	$50,000
EV Chargers	10	300 kW each (3 MW total)	$800,000
Interconnection Cost			$150,000
Battery + EV Integration Subtotal	–	–	**$3,308,500**

Option 2

Component	Count	Size	Total
Battery System	3	600 kW / 2.4 MWh	$742,500
Inverter	4	166 kW AC, 1500V DC	$73,000
Transformer	1	2.5 MVA	$30,000
EV Chargers	0	N/A	$0
Interconnection Cost			85,000
Battery + Integration Subtotal	–	–	**930,500**