



Puerto Rico Recreation Center

LovEnergy Platform demonstration: decarbonization, EV charging, storage and peak-management co-optimization

PLATFORM DEMONSTRATION

BUILDING Recreation center	LOCATION San Juan, Puerto Rico	DATA Public / representative	PRIMARY DRIVER Integrated decarbonization
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Decision Challenge

Demonstrate how a building can appear successfully decarbonized on an annual-energy basis yet create a new grid problem when substantial EV charging load is added. The case tested whether coordinated storage and managed charging could preserve the building-side benefits while controlling the new peak.

How the LovEnergy Platform Was Used

The LovEnergy Platform modeled the building, efficiency measures, PV, storage, GSHP, and EV charging as a connected energy system rather than separate technology studies. It tracked annual consumption, peak demand, utility imports / exports, and the effect of flexible dispatch as the portfolio changed. **The demonstration shows how the same platform can stress-test future electrification before infrastructure decisions are locked in.**

BASELINE Building loads + existing energy use	DECARBONIZE Efficiency, PV + thermal measures	ADD EV LOAD Electrification stress test	FLEXIBILITY BESS + managed charging	GRID OUTCOME Peak, imports + upgrade exposure
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LovEnergy Platform Capabilities Demonstrated

ELECTRIFICATION STRESS TESTING Quantifies how new electric loads can change peak demand even when annual building energy use has fallen.	DER + FLEX CO-OPTIMIZATION Tests storage and managed charging together with PV rather than sizing each asset independently.	GRID-IMPACT VISIBILITY Tracks utility import/export and peak timing so building decarbonization decisions remain compatible with grid constraints.
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Scenario Progression

SCENARIO	MODELED RESULT	WHAT CHANGED	GRID IMPLICATION
Building decarbonization before EVs	Electric -74%; gas -100%; peak -54%	Efficiency + DER portfolio created net-export behavior	Strong building result with lower utility dependence.
EV charging added	Electric use +80%; peak +93%	Transportation electrification introduced a large new controllable load	Created a materially larger peak despite prior decarbonization gains.
Storage + managed charging	103 kW / 627 kWh BESS; utility imports - 53%	Peak shifted from daytime to nighttime	Reduced potential grid constraints and electrical-upgrade exposure.

Client Value and Building-to-Grid Decision

WHAT THE DEMONSTRATION REVEALED - Annual energy and emissions metrics can hide a growing peak-demand problem. - Storage value depends on coordinated dispatch with flexible loads, not simply installed kWh capacity.	OWNER / MANAGER VALUE ILLUSTRATED Shows how storage and managed charging can absorb EV load growth without creating a new uncontrolled peak, reducing grid and upgrade exposure. B2G DECISION: Plan EVs, DERs and flexible loads together to avoid a new unmanaged grid peak.
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