

GAIERGY Corp

Energy Contracts to Finance Public Batteries



Paying for a battery from its savings,
and running it safely for 25 years

For cities, counties, states, schools,
authorities, airports, housing agencies,
nonprofits and federal agencies.
Worked examples from New York,
New Jersey and California.

October 2026

GOAL

This report helps any public or nonprofit owner pay for a battery from the energy costs it cuts, and keep it safe and earning for its whole life. It explains two types of contracts, the energy savings performance contract (ESPC) and the utility energy service contract (UESC). It then shows why operations and maintenance (O&M) decide the outcome.

READ THIS FIRST

Key takeaways

01

Every public owner has a path

- Cities, counties, states, schools
- Authorities, IDAs, housing authorities
- Nonprofits; federal agencies too

02

The contract is half the job

- Contract: pays for the battery
- O&M: decides payback and safety

03

A battery can count as savings

- 19 state laws reviewed
- Only Florida and Washington name storage
- Load management counts

04

Terms run long

- New York: up to 35 years
- 10 of 19 states: 20 years or less
- 7 states: 25 to 35 years

05

Utilities can be the contractor

- Utility competes as the ESCO
- Tariff or procurement exemption
- Public power: NYPA, Ava

06

Savings pay the bill, not backup

- Demand charges and peak programs
- Resilience: real value, no cash

07

Most failures are build and run

- 65% of root causes: integration, construction, operation
- 72% in the first two years
- Cells: 11%

08

One missed peak can cost the month

- Billed demand: the highest 15 minutes
- Monitoring and dispatch are the savings

09

Tax credit gates can zero the credit

- Direct pay: cities, states, authorities, nonprofits
- Domestic content or zero
- Foreign entity test: 55% in 2026, 75% after 2029

10

Three examples, paying programs nationwide

- Worked examples: New York, New Jersey, California
- 42 of the other 47 states: a paying path found
- 5 states not yet verified

11

Busy airport garages pay fastest

- Solar + battery + EV best in all 3 states
- EV sale 3 to 4x export or more
- 200-stall garage: package near break-even, battery alone later

12

Write O&M into the contract

- Full-term M&V, availability guarantee
- Augmentation, 24/7 monitoring
- Fire department training, end-of-life plan

13

Build your own program

- Size and specify the battery
- Owner's representative, qualified lenders
- O&M management to replacement

What is in this report

A Acronyms

1 The short answer

2 Who can use energy contracts

3 What a battery is, and why each part is there

4 What a battery earns a public owner

5 ESPC and UESC side by side, and six other paths

6 The law

7 Beyond New York, New Jersey and California

8 Airports are different

9 The tax credit gates

10 Operations and maintenance: the half that decides the outcome

11 Real projects

12 Two sample sites

13 Solar, storage and EV charging together

14 Checklist and contract clauses

15 How Gaiergy helps you build your own battery energy savings contract

S Sources

How to read the sources: each fact carries a short source name and a number. The number links to the full source list at the end, which gives the document name, the web address and the date accessed (2026-10-02 or 2026-10-03). Tags mark facts that are **UNCONFIRMED** or an **ESTIMATE**. Gaiergy opinion and Gaiergy readings of a source carry a **GAIERGY VIEW** tag or sit in a green box. **PRESS ONLY** marks a number found only in news or trade press, and **VENDOR** marks a company's own claim.

Acronyms

ACRONYM	MEANING
AAA	Highest municipal credit rating
AC	Alternating current
ACEEE	American Council for an Energy-Efficient Economy
AFFECT	Assisting Federal Facilities with Energy Conservation Technologies (FEMP grants)
AIG	Airport Infrastructure Grants (FAA, Bipartisan Infrastructure Law)
AIP	Airport Improvement Program (FAA)
ANSI	American National Standards Institute
ASRID	Airport Safety and Resilient Infrastructure Discretionary Program (FAA)
ATB	Annual Technology Baseline (NREL)
BESS	Battery energy storage system
BMS	Battery management system
BPU	New Jersey Board of Public Utilities
BVAL	Bloomberg Valuation benchmark yield
CAL FIRE	California Department of Forestry and Fire Protection
CCA	Community choice aggregator
CEC	California Energy Commission
CESER	DOE Office of Cybersecurity, Energy Security, and Emergency Response
CFR	Code of Federal Regulations
CHP	Combined heat and power
COPs	Certificates of participation
CPUC	California Public Utilities Commission
CSD	Community services district
CSRP	Commercial System Relief Program (New York utility demand response)
CSV	Comma-separated values data file
DC	Direct current
DCAS	New York City Department of Citywide Administrative Services
DER	Distributed energy resource
DES	Washington State Department of Enterprise Services
DLM	Dynamic Load Management (National Grid New York programs)
DLRP	Distribution Load Relief Program (New York utility demand response)
DoD	US Department of Defense
DOE	US Department of Energy
DOT	Department of Transportation
DR	Demand response
ECAA	Energy Conservation Assistance Act (California loans)
EERE	DOE Office of Energy Efficiency and Renewable Energy
EIA	US Energy Information Administration
ELRP	Emergency Load Reduction Program (California)

ACRONYM	MEANING
ICAP	Installed capacity (NYISO market)
IDA	Industrial development agency (New York)
IDIQ	Indefinite delivery, indefinite quantity contract
IFC	International Fire Code
ILCS	Illinois Compiled Statutes
IPMVP	International Performance Measurement and Verification Protocol
IRS	Internal Revenue Service
IRWD	Irvine Ranch Water District
ITC	Investment tax credit
JBSA	Joint Base San Antonio
JCI	Johnson Controls
K-12	Kindergarten to grade 12 schools
kW, kWh	Kilowatt, kilowatt-hour
LBNL	Lawrence Berkeley National Laboratory
LCOE	Levelized cost of energy
LCOS	Levelized cost of storage
LFN	Local Finance Notice (New Jersey Division of Local Government Services)
LFP	Lithium iron phosphate (a battery cell chemistry)
MLD	Municipal light department (Massachusetts)
MMWEC	Massachusetts Municipal Wholesale Electric Company
MOU	Memorandum of understanding
MSD	Metropolitan School District (Indiana)
M&V	Measurement and verification
MW, MWh	Megawatt, megawatt-hour
NFPA	National Fire Protection Association
NMPC	Niagara Mohawk Power Corporation (National Grid, Upstate New York)
NREL	National Renewable Energy Laboratory (now National Laboratory of the Rockies)
NRS	Nevada Revised Statutes
NYCHA	New York City Housing Authority
NYCIDA	New York City Industrial Development Agency
NYCRR	New York Codes, Rules and Regulations
NYISO	New York Independent System Operator
NYP&A	New York Power Authority
NYS	New York State
NYSERDA	New York State Energy Research and Development Authority
OBF	On-bill financing
OKC	Oklahoma City
O&M	Operations and maintenance
ORC	Ohio Revised Code
PAL	New York Public Authorities Law
PANYNJ	Port Authority of New York and New Jersey
PCS	Power conversion system (inverter)
PFE	Prohibited foreign entity

ACRONYM	MEANING
EMS	Energy management system (the site controller)
EPA	US Environmental Protection Agency
EPB	EPB of Chattanooga (city-owned electric utility)
EPC	Energy performance contract (New York law); also engineering, procurement and construction
EPRI	Electric Power Research Institute
ERCOT	Electric Reliability Council of Texas
ESA	Energy sales agreement (federal ESPC structure) or energy services agreement (local contracts)
ESCO	Energy service company
ESIP	Energy Savings Improvement Program (New Jersey)
ESPC	Energy savings performance contract
ESS	Energy storage system
EV	Electric vehicle
FAA	Federal Aviation Administration
FAQ	Frequently asked questions
FEMP	Federal Energy Management Program (DOE)
FEOC	Foreign entity of concern (now prohibited foreign entity)
FERC	Federal Energy Regulatory Commission
FSRI	Fire Safety Research Institute (UL)
FSWG	New York Inter-Agency Fire Safety Working Group
FTA	Federal Transit Administration
FY	Fiscal year
GAO	US Government Accountability Office
GEB	Grid-interactive efficient building
GML	New York General Municipal Law
GMP	Green Mountain Power
GO	General obligation (bond); also General Order (CPUC)
GSA	US General Services Administration
GW	Gigawatt
GWh	Gigawatt-hour
HRS	Hawaii Revised Statutes
HUD	US Department of Housing and Urban Development
HVAC	Heating, ventilation and air conditioning

ACRONYM	MEANING
PG&E	Pacific Gas and Electric Company
PJM	PJM Interconnection (regional grid operator)
PNNL	Pacific Northwest National Laboratory
POI	Point of interconnection
PPA	Power purchase agreement
PSC	Public Service Commission
PSE&G	Public Service Electric and Gas Company
RAS	Resiliency Asset Service (Georgia Power tariff)
RCAM	Redwood Coast Airport Microgrid
RCEA	Redwood Coast Energy Authority
RCW	Revised Code of Washington
RFP	Request for proposals
R-PGL	Reauthorization Program Guidance Letter (FAA)
SC-3	National Grid Service Classification 3 (large general service)
SCADA	Supervisory control and data acquisition
SDG&E	San Diego Gas and Electric
SGIP	Self-Generation Incentive Program (California)
SUNY	State University of New York
TOU	Time of use (electric rate)
UESC	Utility energy service contract
UH	University of Hawaii
UL	UL Standards and Engagement and UL Solutions (safety standards and testing)
ULSE	UL Standards and Engagement
USC	United States Code
VALE	Voluntary Airport Low Emissions program (FAA)
WAC	Washington Administrative Code
ZEV	Zero emission vehicle (FAA pilot program)

The short answer

THE ANSWER

Any public or nonprofit owner can pay for a battery from the energy costs it cuts. An energy savings performance contract (ESPC) or a utility energy service contract (UESC) can carry the cost with no money down. **But the contract is only half the job.** The other half is 25 years of operations and maintenance. That half decides whether the savings arrive and whether the battery stays safe.

35 yrs

maximum energy performance contract term in New York (NY Energy Law 9-102, 9-103^[1])

65%

of classified failure root causes: integration, construction and operation (EPRI 2024 root cause paper^[2])

72%

of known-age failures: build to year two (EPRI 2024 root cause paper^[2])

99%

drop in failures per GWh deployed, 2018 to 2025, read from EPRI's chart (EPRI failure rate chart 2026^[3])

Cities, counties, states, schools and public authorities sign energy savings performance contracts under state law; New York allows terms up to 35 years (NY Energy Law 9-102, 9-103^[1]). Nonprofits sign the same kinds of contracts privately (US EPA, ESPC and ESA page^[4]). Housing authorities use HUD's version, up to 20 years (24 CFR 990.185^[5]). Some utilities offer the battery as a service on the bill (Xcel MN tariff A43^[6]). Federal agencies have their own law: up to 25 years under 42 U.S.C. 8287(a)(1) (42 USC 8287^[7]). The US Department of Energy (DOE) says a battery can meet the efficiency test through “*electricity load management*” (FEMP ESPC scope FAQ 2022^[8]). Section 2 shows the path for each kind of owner.

WHERE THE EXAMPLES COME FROM

The worked examples in this report come from New York, New Jersey and California. The rest of the country has viable incentives and capabilities to host batteries too; Section 7 shows them region by region.

So money is rarely the hard part. The hard part comes after the ribbon cutting:

- Most battery failures with a known cause came from how the system was built, commissioned and run, not from the cells. Integration and construction caused 36% and operation caused 29% (EPRI 2024 root cause paper^[2]).

- 72% of failures with a known system age happened during construction, commissioning or the first two years of operation (EPRI 2024 root cause paper^[2]).
- A battery that sits idle saves nothing. In California's incentive program, 40 sampled nonresidential projects (4%) discharged 0 kWh in all of 2024; most applied in 2012 to 2016 and reflect one developer's later decommissioning (SGIP 2024 evaluation^[9]).
- A demand charge is set by the single highest interval in the month, usually 15 minutes (NREL/BR-6A20-68963^[10]). If the battery misses that interval, most of the month's demand savings are gone **GAIERGY VIEW**.



HALF ONE

The contract pays for it

- Investment grade audit
- Design and construction
- Financing for up to 25 years (35 in New York)
- Savings guarantee
- Measurement and verification



HALF TWO

O&M makes it pay and keeps it safe

- 24/7 monitoring and alarm response
- Dispatch at every monthly peak
- Maintenance, spare parts, firmware
- Capacity top-up as cells age
- Fire department plan and training
- Removal and recycling at end of life

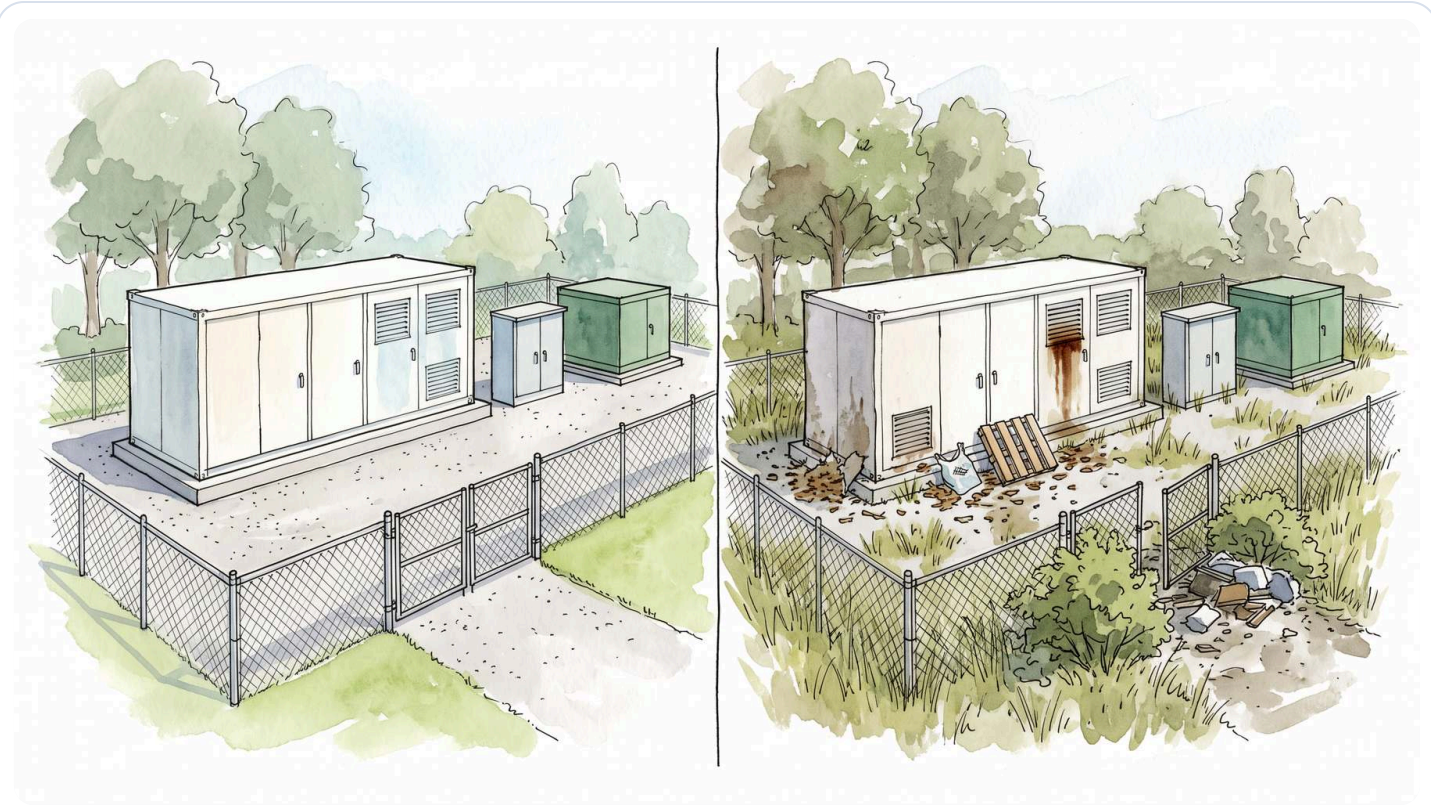


Figure 1. The same battery yard at year 1 and at year 15. Financing builds the left side. Only a funded O&M plan keeps it looking like that. Illustration, Gaiergy.

GAIERGY VIEW

Treat a battery like a pump station or a substation. It is public infrastructure with a 20 to 25 year duty. Recommendation: consider buying the O&M, the monitoring and the end-of-life plan in the same contract that buys the battery, for the same term.

Who can use energy contracts

THE ANSWER

Almost every kind of public or nonprofit owner has a legal path to pay for a battery through an energy contract. **Cities, counties, states, schools, authorities, special districts, airports, housing authorities, industrial development agencies and nonprofits all have one.** Federal agencies have their own. The path differs by owner type, and so does the money it can use.

Each card names the legal path, how the owner pays, and a real project with its source. Where no battery under an energy contract was found for an owner type, the card says so.

01



City or town

State ESPC law, service agreement, or utility host

LEGAL PATH

- State energy savings contract law, such as New York Energy Law 9-103, New Jersey's Energy Savings Improvement Program (ESIP) or California Government Code 4217 (NY Energy Law 9-102, 9-103^[1]; NJ P.L.2009 c.4; P.L.2012 c.55^[11]; Cal. Gov. Code 4217.10-.19^[12])
- Or a power purchase and battery services agreement adopted by ordinance (Santa Barbara Council minutes 2026-03-10^[13])

HOW IT PAYS

- Savings repay a tax-exempt lease, or a service fee comes from the operating budget

Project: San Diego, nearly 4 MWh of batteries inside an energy and water savings contract financed by a tax-exempt lease of nearly \$112 million over 25 years (City of San Diego EWSPC^[14]). Santa Barbara adopted a police station “Power Purchase and Battery Energy Storage Services Agreement” on 2026-03-10; size **UNCONFIRMED** (Santa Barbara Council minutes 2026-03-10^[13])

02



County

State ESPC law or long-term power purchase

LEGAL PATH

- County ESPC laws in most states reviewed (Section 6)
- Or a power purchase or energy-as-a-service contract approved through the budget (Montgomery County Council 2021^[15])

HOW IT PAYS

- Per-kWh price plus a resilience charge from the utilities budget (Montgomery County Council 2021^[15])

Project: Montgomery County, Maryland, Brookville bus depot: 25-year power purchase agreement, first-year energy charge 12.3 cents/kWh, a 2 MW battery on the council slide (Montgomery County Council 2021^[15]). Battery MWh **UNCONFIRMED**

03



State agency or state university

State ESPC law, NYPA, campus power purchase

LEGAL PATH

- State agency ESPC laws (Section 6), or in New York, the New York Power Authority (NYPA) (NY PAL 1005(17)^[16])

HOW IT PAYS

- Campus power purchase price from the operating budget, or NYPA financing repaid by the campus

Project: Sonoma State University, 30-year contract signed 2021, a “1.55 MW battery bank” with 4.1 MW of solar, almost \$1 million of savings in 2026 (Sonoma State 2026^[17]). MW or MWh **UNCONFIRMED**. SUNY Fredonia: 500 kW of storage under a NYPA-managed power purchase agreement (SUNY Fredonia 2020^[18])

04



School district

State ESPC law, school rules

LEGAL PATH

- State ESPC law; New York schools also need Education Department approval and are capped at 18 years (8 NYCRR 155.20^[19])

HOW IT PAYS

- Guaranteed savings repay the contract

Projects: Greenburgh Central School District, New York: \$20.5 million ESPC with a 775 kW AC battery **VENDOR** (RWE 2024, Greenburgh^[20]). Newark Board of Education, New Jersey: a \$95 million ESIP with Johnson Controls, about 17 MW of solar by power purchase agreement and combined heat and power units; the only battery named is storage for a stadium wind turbine's lighting, size not given (Newark Board of Education ESIP page^[21])

05



Public authority or special district

Water, sewer, transit, college districts

LEGAL PATH

- State ESPC laws that cover districts, such as California Government Code 4217 (Cal. Gov. Code 4217.10-.19^[12])

HOW IT PAYS

- Shared bill savings or a service fee to a third-party owner

Project: Irvine Ranch Water District, California: 6.25 MW / 35.7 MWh at six facilities, owned and operated by Macquarie Capital, about \$500,000 a year of energy savings (IRWD 2018^[22]). Contract form **UNCONFIRMED**

06



Airport

Same contracts, plus FAA rules

LEGAL PATH

- Any contract above, inside the federal airport revenue and land rules (Section 8)

HOW IT PAYS

- Airport revenue, which stays at the airport (49 USC 47107^[23])

Project: Fresno Yosemite International Airport: a 2,000 kW / 3,828 kWh battery under an energy services agreement at a fixed \$0.2107/kWh for 20 years (Fresno Council ID 26-566^[24])

07

Public housing authority



HUD energy performance contract

LEGAL PATH

- HUD-approved energy performance contract, *"The contract period shall not exceed 20 years"* (24 CFR 990.185^[5])
- HUD's 2024 notice does not name batteries as a measure (HUD PIH 2024-27^[25]); a HUD staff deck names *"Solar Plus Battery Storage"* (HUD Energy Branch slides 2023^[26])
- New Jersey lets the utility board allow a housing authority to use the HUD process inside ESIP (NJ P.L.2012 c.55^[27])

Projects: no housing authority battery under an energy contract was found. Grants lead: Worcester Housing Authority, 125 kW / 261 kWh, \$521,640 state grant, awarded 2026-09-18 (Mass. DOER 2026^[28]). NYCHA has a battery planned with NYPA at Borinquen Plaza; size **UNCONFIRMED** (NYCHA 2023^[29]). In New Jersey, the Newark Housing Authority used two HUD-approved energy performance contracts, \$134 million in all, with cogeneration units that give power during outages; no battery was included **VENDOR** (Constellation, Newark Housing Authority^[30])

08

Industrial development agency



New York IDAs and their counterparts

LEGAL PATH

- New York IDAs may assist a *"renewable energy project"*, which points to equipment in Real Property Tax Law 487; that law lists *"various types of batteries"* (NY GML 854^[31]; NY RPTL 487^[32]). Reading the two together to cover a stand-alone battery is **GAIERGY VIEW**

HOW IT PAYS

- Sales tax exemption, payments in lieu of taxes, or conduit bonds for a private owner (NY GML 858^[33]; NY GML 874^[34])

Projects: the New York City IDA closed 14 battery projects in fiscal 2025, *"nearly 100 MW"* (NYCIDA FY2025^[35]). All found are privately owned. Section 15 covers the IDA role

09

Nonprofit hospital, university or housing group



Private contract, direct pay

LEGAL PATH

- Public ESPC laws in New York, New Jersey and California name public bodies, so a private nonprofit signs an ordinary private contract instead **GAIERGY VIEW** (NY Energy Law 9-102, 9-103^[1]; NJ P.L.2009 c.4; P.L.2012 c.55^[11]; Cal. Gov. Code 4217.10-.19^[12])
- The US Environmental Protection Agency (EPA) notes ESPCs are mostly used by government and nonprofit entities (US EPA, ESPC and ESA page^[4])

HOW IT PAYS

- Service fee, loan or cash; tax-exempt nonprofits can take the storage credit as a direct payment (Section 9) (26 USC 6417^[36])

Project: Hackensack Meridian Health, New Jersey: a 30-year energy-as-a-service agreement, \$134 million of work, nearly 98% of it solar and battery storage **VENDOR** (ENFRA, HMM project page^[37]). Battery size **UNCONFIRMED**



Federal agency

Its own ESPC and UESC laws

Federal agencies sign ESPCs for up to 25 years under 42 U.S.C. 8287(a)(1) and utility contracts under 42 U.S.C. 8256 (42 USC 8287^[7]; 42 USC 8256^[38]). Example: Marine Corps Recruit Depot Parris Island, a 4.0 MW / 8 MWh battery inside a \$91 million project **VENDOR** (Ameresco 2019, Parris Island^[39]). Sections 5 and 6 treat the federal contracts as one variant among many.

GAIERGY VIEW

The owner type sets three things: which law the contract sits under, whether the owner can take the tax credit as cash, and how long the term can run. Recommendation: consider settling those three questions before choosing a contractor.

What a battery is, and why each part is there

THE ANSWER

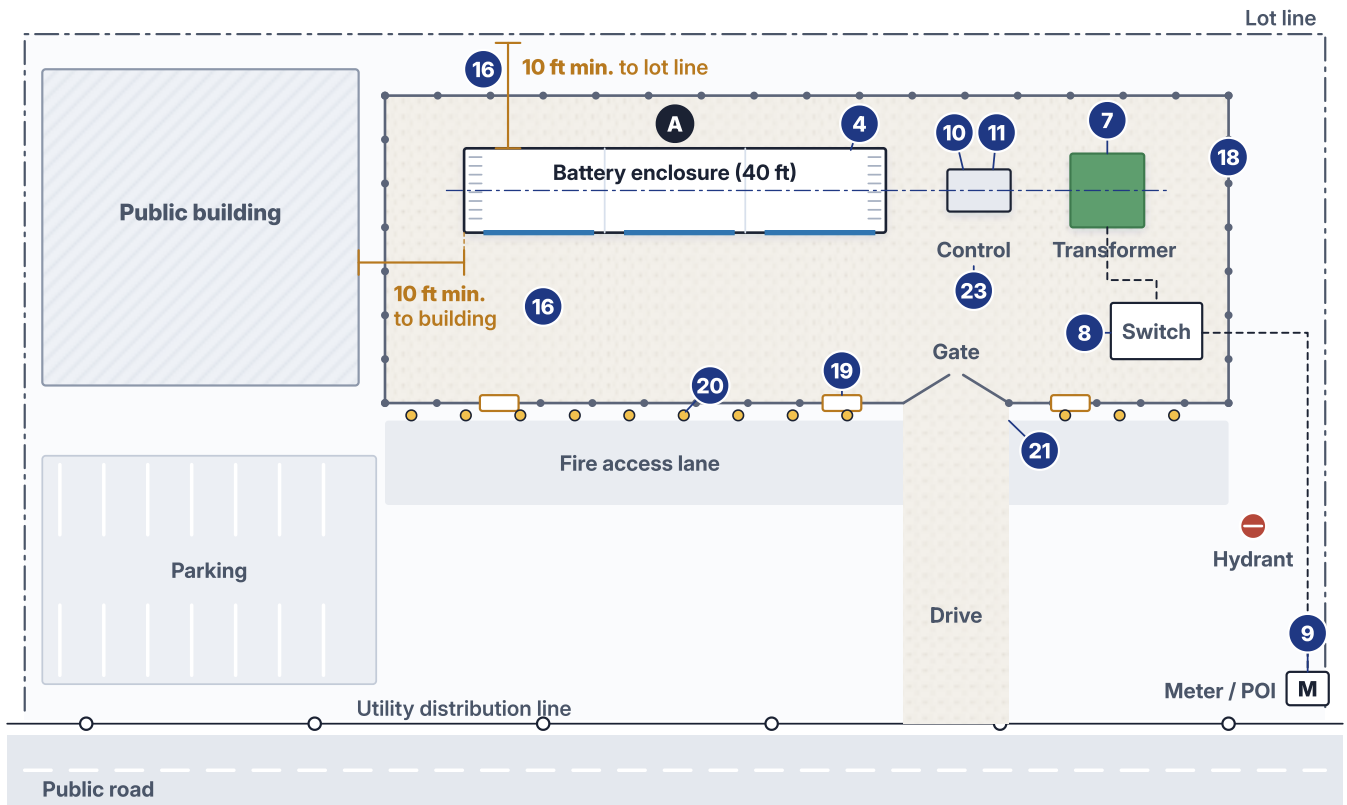
A battery site has about 23 working parts. Only one of them stores energy. The others convert, control, protect, connect and watch it. **Most failures start in those other parts:** controls caused 46% of classified failures and the balance of system 43%. Cells caused 11% (EPRI 2024 root cause paper^[2]).

A system integrator puts battery modules in containers, adds cooling and fire suppression, and connects them to the inverter. A construction contractor installs the system and connects it to the grid (PNNL 2020^[40]). The Pacific Northwest National Laboratory (PNNL) groups the hardware into the storage block, the balance

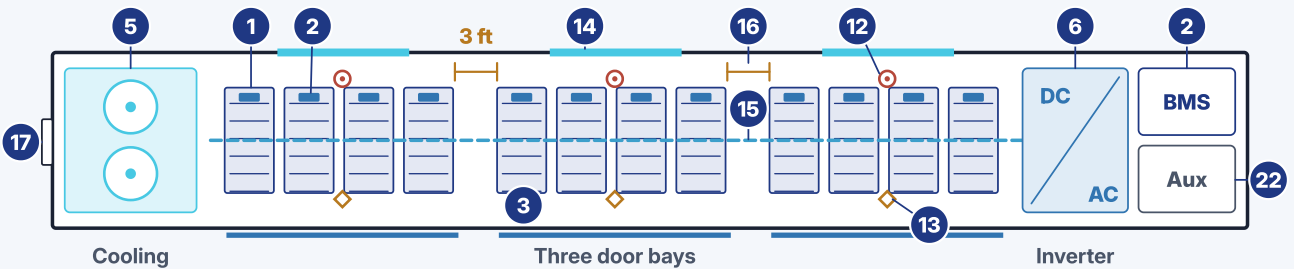
of system, the power conversion system, controls and communication, and grid integration (transformer, busbars, breakers and meters) (PNNL 2020^[40]).

A battery site, and why each part is there

Plan view. Numbers match the parts key in the next figure.



A Inside the enclosure, roof removed (enlarged)



Fire access lane and hydrant are shown for context: the sources set no size or spacing for them; the local fire code official does. Schematic plan, not to scale except the marked minimum distances.

Gaiergy illustration. Sources (accessed Oct. 2, 2026): 2020 Fire Code of New York State, Sec. 1206, and NYSEDA BESS Model Law, both in NYSEDA BESS Guidebook (Nov. 2024); DOE FEMP Lithium-Ion BESS Technical Specifications (2025 template) and BESS Procurement Checklist (Feb. 2023); PNNL 2020 Lithium-ion cost methodology; UL 9540 third edition (ULSE, 2023); CPUC GO 167-C (2025).

Figure 2. An outdoor battery site in plan view; the numbers match the parts key in the next figure and the cards below. Gaiergy graphic based on PNNL, the New York fire code and the DOE Federal Energy Management Program (FEMP) specification cited in the cards.

The 23 parts of a battery site, and why each one is there

Numbers match the site plan in the previous figure.

- 1 Cells, modules and racks**
Store the energy. Cells are the fuel in a thermal runaway, even when the failure starts elsewhere (Gaiergy view).
- 2 Battery management system (BMS)**
The fire code requires a BMS where the system's listing calls for it.
- 3 Thermal runaway protection**
A listed device or method to prevent, detect and limit the impact of thermal runaway; may be part of the BMS.
- 4 Enclosure**
Noncombustible steel box on a pad. Keeps weather and water out.
- 5 Cooling (HVAC or liquid)**
Holds the cells inside the warranty temperature window.
- 6 Power conversion system (inverter)**
Turns battery DC into grid AC and back. Listed to UL 1741.
- 7 Step-up transformer**
Raises inverter voltage to the voltage of the utility line.
- 8 Switchgear and protective relays**
Clears faults and isolates the battery. Visible disconnect.
- 9 Revenue meter at the point of interconnection**
Measures energy in and out for bills and program pay.
- 10 Energy management system (EMS)**
Decides when to charge and discharge. Makes the savings.
- 11 SCADA and communications**
Lets the owner and O&M provider watch the battery.
- 12 Fire and smoke detection**
Monitored by a supervising station (NFPA 72).
- 13 Gas detection**
Detects flammable off-gas. For lithium-ion, off-gas is handled through explosion control; where exhaust is used, it starts at 25% of the lower flammable limit.
- 14 Explosion control**
Vents (NFPA 68) or ventilation (NFPA 69) for battery off-gas.
- 15 Fire suppression**
Sprinklers or approved alternatives in rooms and walk-in units.
- 16 Setbacks and spacing**
10 ft clearance to lot lines, buildings, public ways and stored combustibles outdoors (New York code); 3 ft between groups of 50 kWh or less.
- 17 UL 9540 listing and UL 9540A test data**
System safety listing. Test data sets spacing and suppression.
- 18 Fence and self-locking gate**
A 7 ft fence keeps the public away from high voltage.
- 19 Signs**
Tell firefighters the hazards and a 24-hour emergency contact.
- 20 Vehicle barriers**
Required where vehicles could hit the equipment.
- 21 Emergency plan and responder training**
Shutdown, alarm and fire steps. Local responders trained.
- 22 Auxiliary and standby power**
The code requires 2 hours of standby power for exhaust and gas detection; keeping cooling and controls on is good practice (Gaiergy view).
- 23 Commissioning, O&M and decommissioning papers**
Plans, O&M manual, service log and a contracted service agency.

Gaiergy illustration. (Gaiergy view) marks Gaiergy's own reading. Sources (accessed Oct. 2, 2026): 2020 Fire Code of New York State, Sec. 1206, and NYSERDA BESS Model Law, both in NYSERDA BESS Guidebook (Nov. 2024); DOE FEMP Lithium-Ion BESS Technical Specifications (2025 template) and BESS Procurement Checklist (Feb. 2023); PNNL 2020 Lithium-ion cost methodology; UL 9540 third edition (ULSE, 2023); CPUC GO 167-C (2025).

Figure 3. The 23 parts of a battery site and why each one is there; the numbers match Figure 2. Gaiergy graphic based on the PNNL, New York fire code and FEMP sources cited in the cards below.

STORE AND CONVERT Parts 1 to 9

01



Cells, modules and racks

Store the energy. Cells are the fuel in a thermal runaway, even when the failure starts elsewhere

GAIERGY VIEW

02



Battery management system

Watches cell voltage, current and temperature, and puts the system in a safe state on a fault. The fire code calls for one where the system's listing calls for it (NYSERDA BESS Guidebook 2024^[41]).

03



Thermal runaway protection

A listed device or method to prevent, detect and limit the impact of thermal runaway; it may be part of the battery management system. The fire code calls for it for lithium-ion (NYSERDA BESS Guidebook 2024^[41]).

04



Enclosure on a pad

Noncombustible steel box. Keeps out weather and water. Outdoor walk-in units over 4,028 cubic feet count as indoor rooms (NYSERDA BESS Guidebook 2024^[41]; FEMP Li-ion BESS spec 2025^[42]).

05



Cooling: air conditioning or liquid

Holds cells inside the warranty temperature window (FEMP Li-ion BESS spec 2025^[42]).

06



Inverter (power conversion)

Turns battery DC into grid AC and back. Listed to UL 1741, a UL Standards and Engagement (UL) standard, for grid use (NYSERDA BESS Guidebook 2024^[41]; FEMP BESS procurement checklist 2023^[43]).

07



Step-up transformer

Raises inverter output to the utility line voltage (PNNL 2020^[40]).

08



Switchgear and relays

Clear faults and isolate the battery, plus a visible disconnect for the utility (FEMP Li-ion BESS spec 2025^[42]).

09



Revenue meter

Measures energy in and out for bills, demand savings and program payments (PNNL 2020^[40]; FEMP BESS procurement checklist 2023^[43]).

CONTROL AND WATCH Parts 10 and 11

10



Energy management system

The site controller. Decides when to charge and discharge. This is what turns the battery into savings. FEMP asks for a written sequence of operations and dispatch updates when tariffs or loads change (PNNL 2020^[40]; FEMP Li-ion BESS spec 2025^[42]).

11



Supervisory control and data acquisition (SCADA), data and communications

Lets the owner and the O&M provider watch the battery. FEMP asks for 15-minute data, at least 36 months stored, alarms, a separate internet connection and agency cybersecurity rules (FEMP Li-ion BESS spec 2025^[42]).

12



Smoke and flame detection

Monitored by a supervising station (NYSERDA BESS Guidebook 2024^[41]).

13



Gas detection

Detects flammable off-gas. Where exhaust ventilation is used, it is designed to keep gas below 25% of the lower flammable limit and has 2 hours of standby power. For lithium-ion, the code handles off-gas mainly through explosion control, not a stand-alone ventilation rule (NYSERDA BESS Guidebook 2024^[41]).

14



Explosion control

Vent panels or ventilation, because battery off-gas can ignite in a closed box. UL 9540, third edition (2023), added explosion control (NYSERDA BESS Guidebook 2024^[41]; ULSE 2023^[44]).

15



Fire suppression

In rooms and walk-in units: sprinklers at 0.3 gpm per square foot, or other agents approved by large-scale tests (NYSERDA BESS Guidebook 2024^[41]).

16



Spacing and setbacks

10 feet from lot lines, buildings, public ways and stored combustibles outdoors, so a fire does not reach neighbors or exits. This is the New York code; other codes and local zoning can differ (NYSERDA BESS Guidebook 2024^[41]).

17



UL 9540 listing and UL 9540A test

System safety listing and fire test data. They justify spacing and suppression choices (NYSERDA BESS Guidebook 2024^[41]).

18



Fence and gate

A fence with a self-locking gate; the New York model law suggests 7 feet as a default each town can edit (NYSERDA BESS Guidebook 2024^[41]).

19



Signage

Hazards, suppression type and a 24-hour emergency contact for firefighters (NYSERDA BESS Guidebook 2024^[41]).

20



Vehicle barriers

Bollards where a vehicle could hit the units, as in a parking lot (NYSERDA BESS Guidebook 2024^[41]).

21



Emergency plan and responder training

Shutdown, alarm and fire procedures, drills and training of local firefighters (NYSERDA BESS Guidebook 2024^[41]; CPUC GO 167-C^[45]).

22



Station and standby power

The code calls for 2 hours of standby power for exhaust ventilation and gas detection (NYSERDA BESS Guidebook 2024^[41]). Keeping cooling and controls on too is good practice [GAIERGY VIEW](#).

23



Commissioning, O&M manual, de-commissioning plan

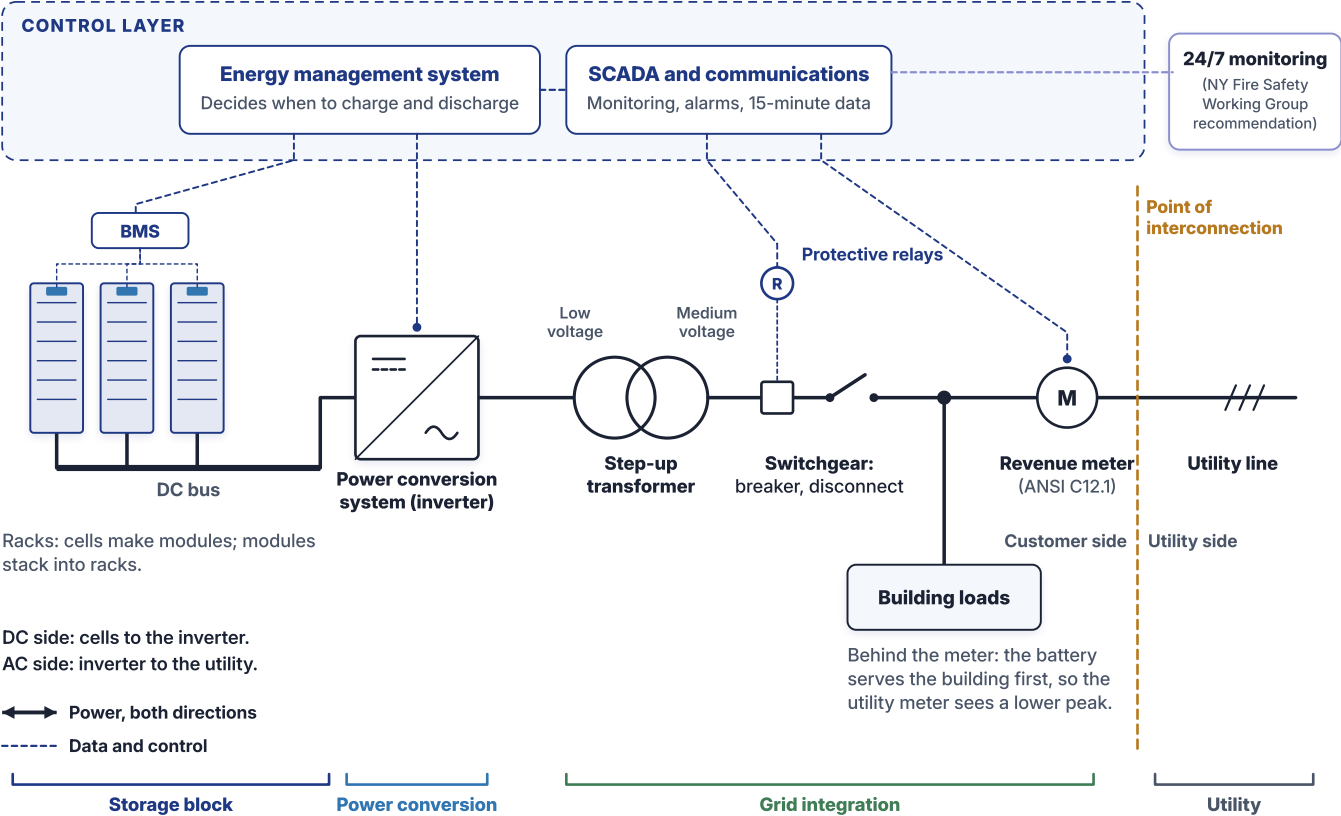
Paper, not hardware, but the fire code lists all three, plus a contracted service agency and a service log (NYSERDA BESS Guidebook 2024^[41]).

Code note: the New York code cited above is the 2020 Fire Code of New York State, Section 1206, as reprinted by NYSERDA. NYSERDA says these rules are based on the 2021 International Fire Code (IFC), where they sit in

Section 1207 (NYSERDA BESS Guidebook 2024^[41]). Whether the 2024 IFC is the same is **UNCONFIRMED**. New York adopted a newer code in 2025 (Section 10).

The one-line diagram: how a battery connects

Power flows both ways on the solid line. The dashed layer carries data and commands.



Gaergy illustration. Sources (accessed Oct. 2, 2026): PNNL 2020 Lithium-ion cost methodology, pp. 1 to 3 (storage block, power conversion, controls, grid integration); 2020 Fire Code of New York State Sec. 1206.10 (BMS duties, UL 1741 inverter); DOE FEMP Li-ion BESS Technical Specifications (2025 template) (relays, breakers, visible disconnect, site controller) and Procurement Checklist (2023) (ANSI C12.1 meter); NY Inter-Agency Fire Safety Working Group, Fire Code Recommendations (July 2024) (24/7 monitoring recommendation). Simplified; protection and metering vary by utility.

Figure 4. How power flows: cell, rack, battery management system, inverter, transformer, switchgear, meter, utility. Gaergy graphic based on PNNL (PNNL 2020^[40]).

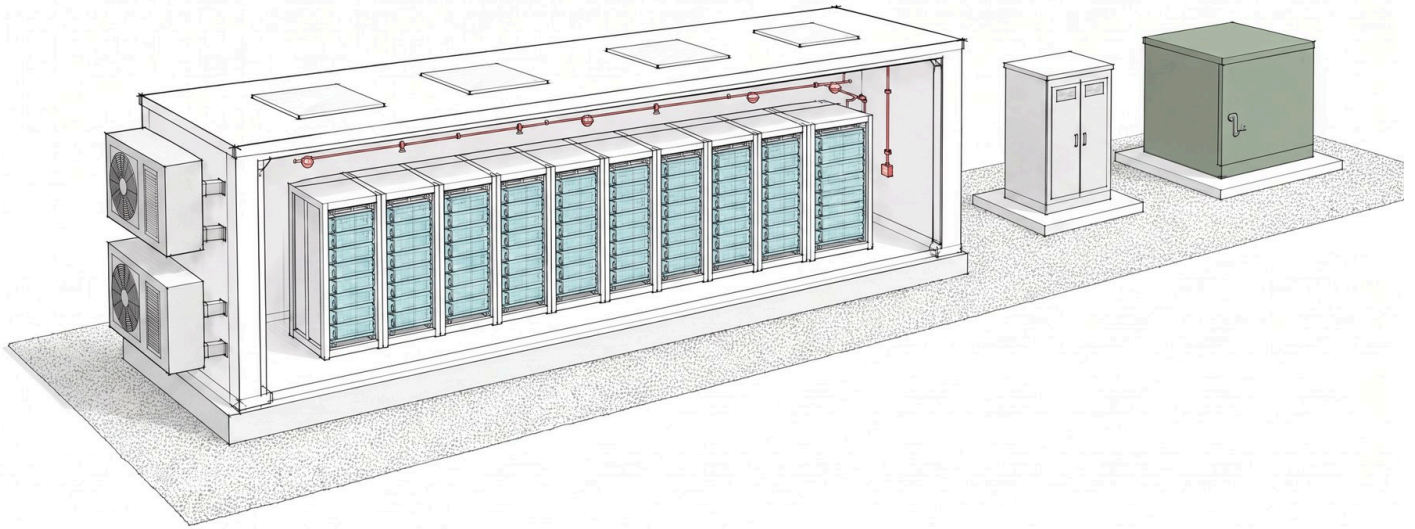


Figure 5. Inside one battery enclosure: racks, cooling, fire and gas detection and explosion venting. Illustration, Gaiergy.

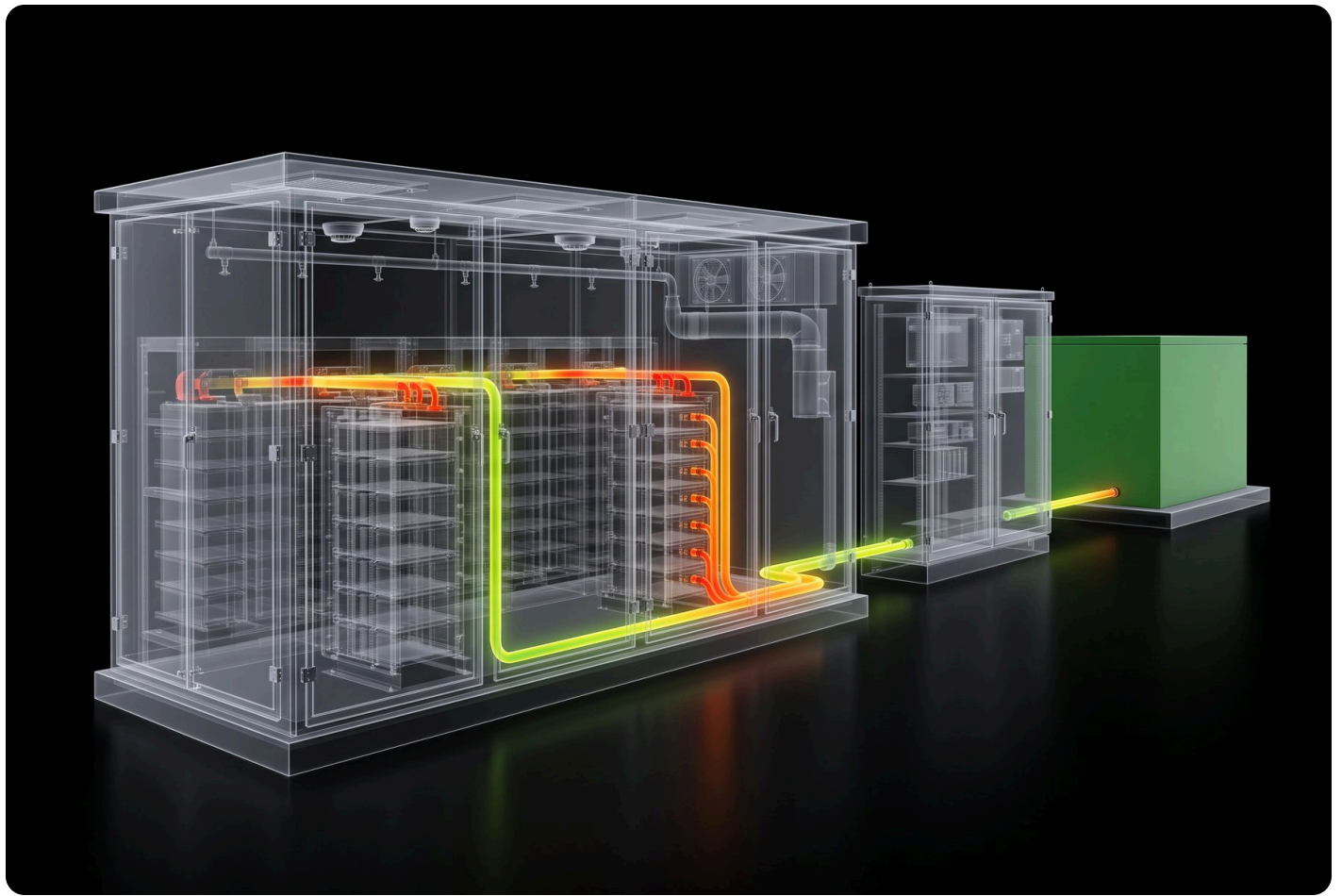


Figure 6. What sits behind the doors. The parts that cause most failures (controls, wiring, cooling and safety systems) are the parts nobody sees from the fence. Illustration, Gaiergy.

The three-piece set at a public site

A typical small public battery site shows three pieces from the fence: the battery enclosure, a small control and communications cabinet, and the transformer. Figures 7 and 8 show the set in plain form.

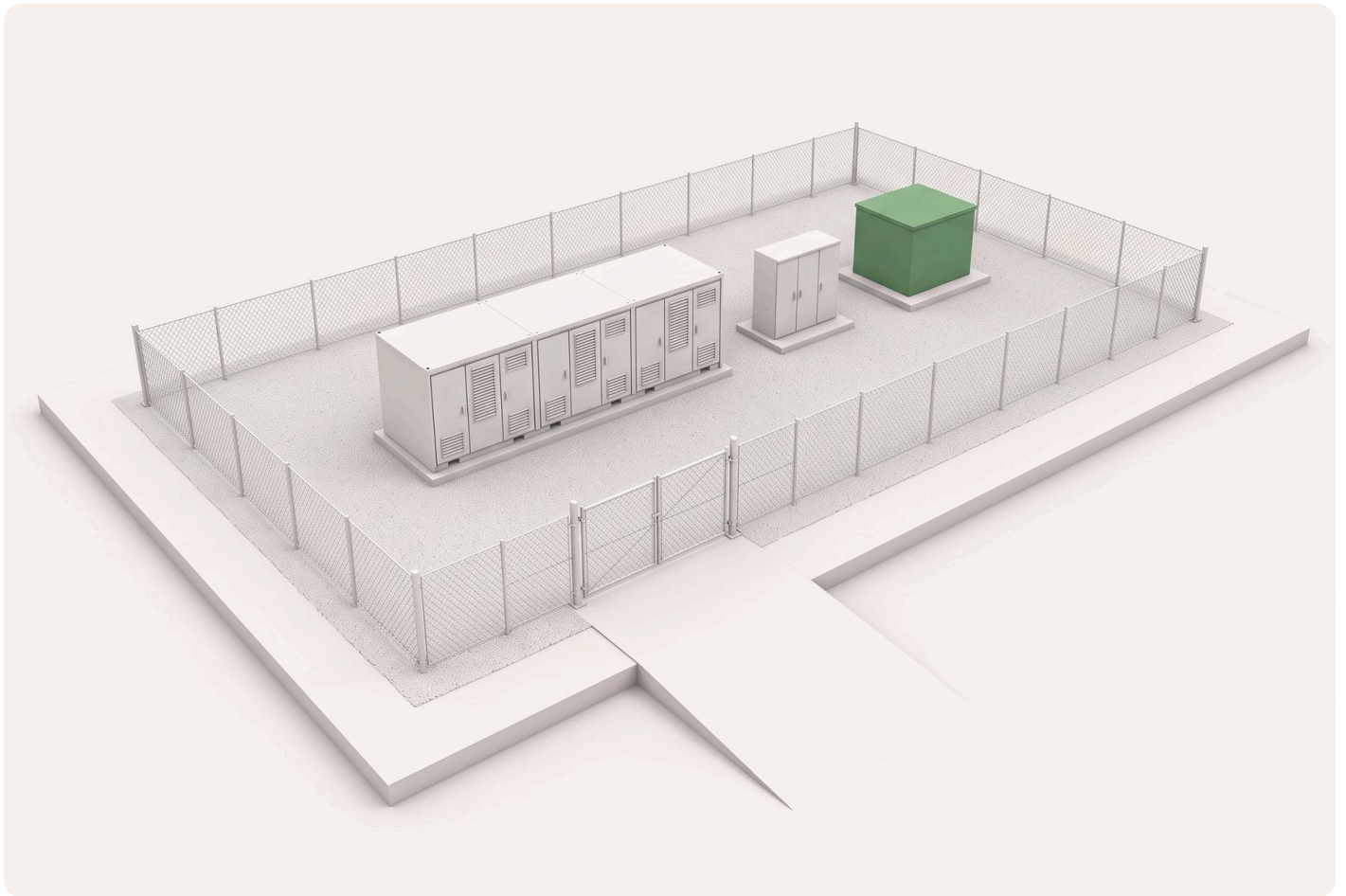


Figure 7. The three pieces a neighbor sees: battery enclosure, control cabinet and transformer. Illustration, Gaiergy.

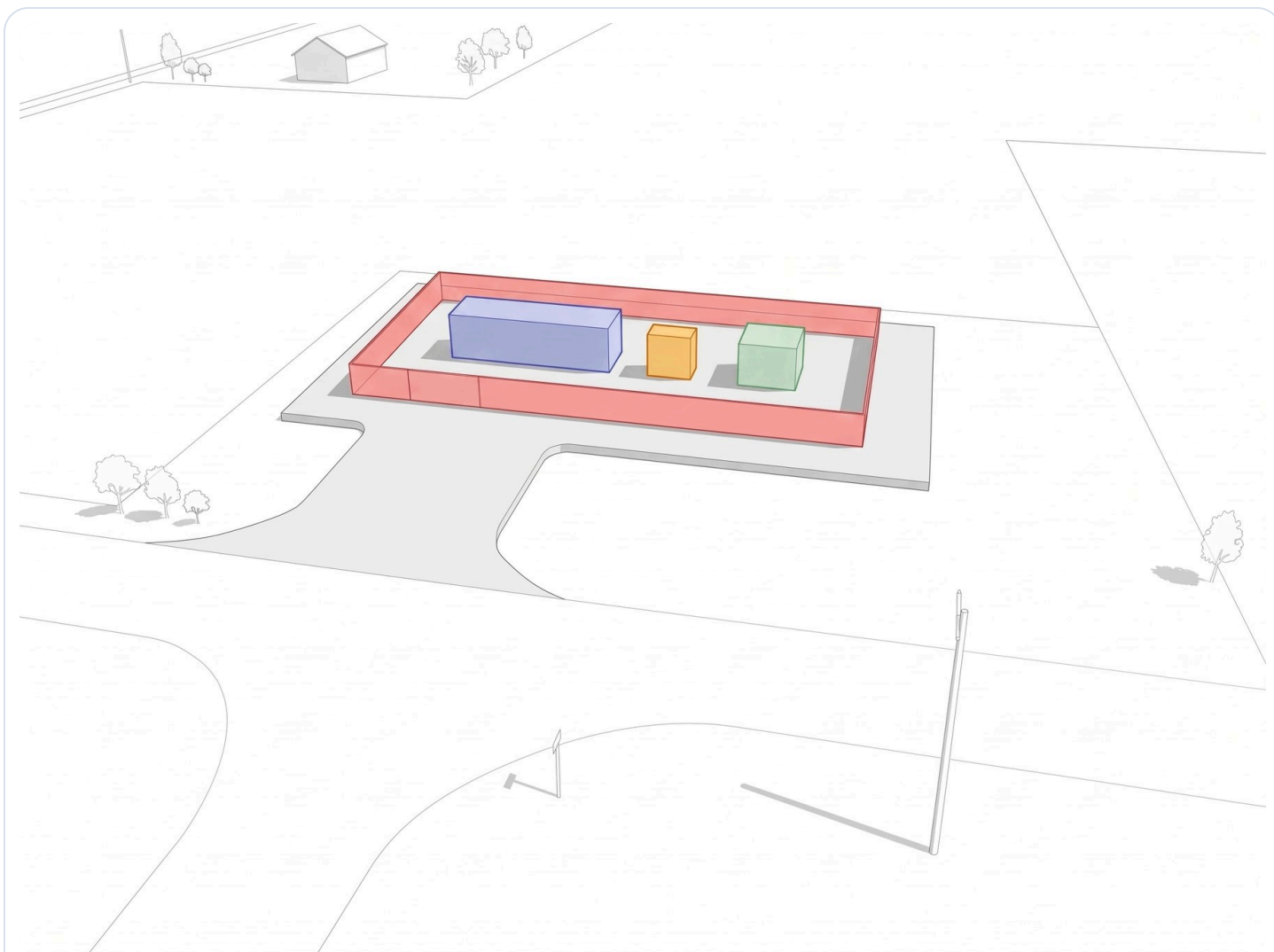


Figure 8. A container site in plain blocks: enclosure, cabinet, transformer, fence and drive. Illustration, Gaiergy.

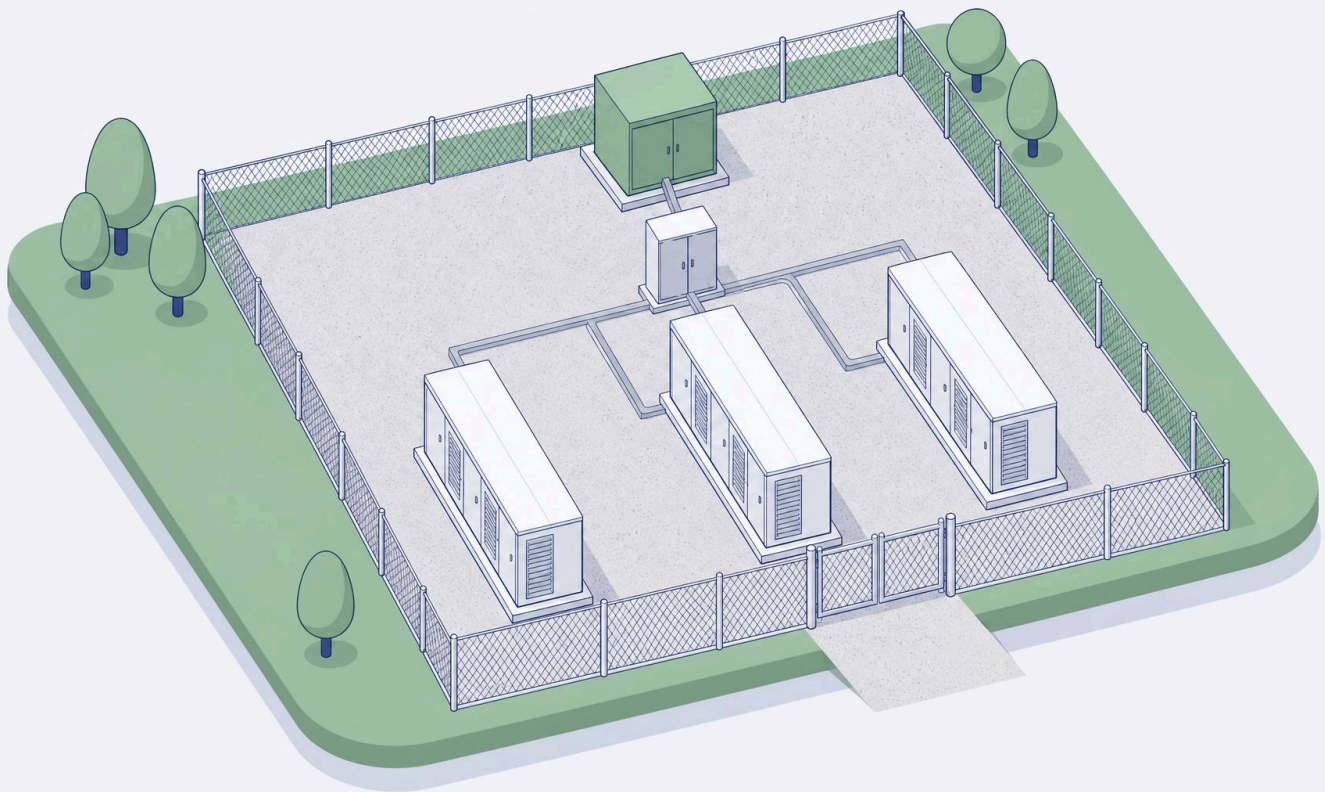


Figure 9. A utility-grade yard: three enclosures share one control cabinet and one transformer. The US Energy Information Administration counts systems of at least 1 MW as utility scale (EIA Today in Energy 41813^[46]). Illustration, Gaiergy.

The building-scale version

A battery that serves one building uses the same parts, smaller. FEMP's template specification describes this case: a behind-the-meter lithium-ion battery in self-contained enclosures on a pad, with cooling, a sequence of operations, commissioning to the National Fire Protection Association standard NFPA 855 or the IFC, and

optional backup through a transfer switch and microgrid controller (FEMP Li-ion BESS spec 2025^[42]). Typical cabinet size for this class of system is **UNCONFIRMED**.



Where it can go

- FEMP: *"It is typically not feasible to place lithium-ion BESS on roofs or in buildings"* (FEMP BESS procurement checklist 2023^[43])
- Consider the site's 100-year flood plain and surge levels (FEMP BESS procurement checklist 2023^[43])
- Outdoor lot: 10 feet from buildings, lot lines and public ways, or 3 feet behind a 1-hour fire barrier that extends 5 feet above and 5 feet beyond the unit (NYSERDA BESS Guidebook 2024^[41])
- Wall mounting only for units of 20 kWh or less (NYSERDA BESS Guidebook 2024^[41])



Parking lots and garages

- Open garages: flame detection, suppression, 10 feet from parked cars and exits (NYSERDA BESS Guidebook 2024^[41])
- Vehicle barriers wherever a car could hit a unit (NYSERDA BESS Guidebook 2024^[41])
- FEMP expected service life: 10 years for the battery and its equipment (FEMP BESS procurement checklist 2023^[43]), so a 20 to 25 year contract needs augmentation or replacement **GAIERGY VIEW**



Figure 10. Building-scale cabinets in a parking lot, with vehicle barriers and clear space. Illustration, Gaiergy.

What a battery earns a public owner

THE ANSWER

A battery earns money four ways. **Two of them carry most contracts: lower demand charges and paid peak programs.** Grid services can add income. Backup power has real value, but it does not pay the bill on its own (PNNL-37058^[47]).



1. Lower demand charges

- Demand charge: set by the highest interval in the bill period, usually 15 minutes (NREL/BR-6A20-68963^[10])
- FEMP counts battery savings from lower peak demand and time-of-use charges (FEMP M&V Guidelines 5.0^[48])

Pays most contracts



2. Paid peak programs

- Utility demand response pays per kW reserved and per kWh delivered
- Rates in the cards that follow

Pays when the battery shows up



3. Grid services

- Capacity, transmission peak and market income
- Federal law lets grid services revenue fund an ESPC (42 USC 8287^[7])

Variable: guarantee with care

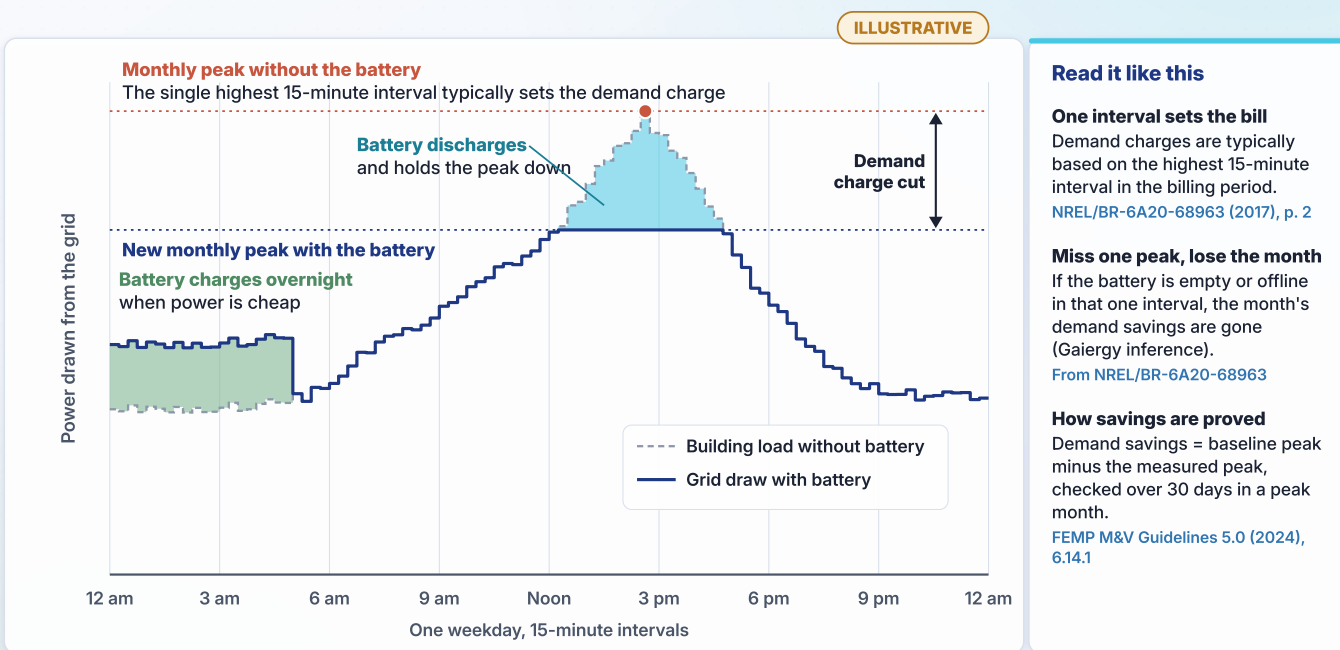


4. Backup power

- Real value in an outage
- No cash savings on its own (PNNL-37058^[47])

A benefit, not a payment source

The battery shaves the one peak that sets the bill



Gaiergy illustration of one weekday, not measured data; no scale is implied. Demand charge basis: McLaren and Mullendore, NREL/BR-6A20-68963 (2017), p. 2; savings check: FEMP M&V Guidelines 5.0 (2024), sec. 6.14.1. Both accessed 2026-10-02.

Figure 11. Peak shaving in one day. The battery charges at night and discharges through the afternoon peak, so the highest 15-minute interval drops. Illustration, Gaiergy; not data from a real site.

1. Lower demand charges

Most commercial and public accounts pay a demand charge. It is “typically based on the highest average electricity usage occurring within a defined time interval (usually 15 minutes) during a billing period” (NREL/BR-6A20-68963^[10]). A battery that discharges during that interval lowers the bill. FEMP's measurement rules treat a battery as a measure that cuts “peak demand and time-of-use energy charges” (FEMP M&V Guidelines 5.0^[48]). At San Diego International Airport, peak demand charges were about 40% of the airport's monthly electricity costs when it added a 2 MW / 4 MWh battery **VENDOR** (Cleantech San Diego 2019^[49]).

2. Paid peak programs

Utilities pay customers to cut load when the grid is tight. A battery can deliver that cut without turning anything off. These rates were on utility and regulator pages on 2026-10-02:

 National Grid, Upstate New York \$2.75 / kW-month (National Grid Upstate NY DR page^[50]) - Commercial System Relief Program (CSRP): \$2.75/kW-month plus \$0.18/kWh (National Grid Upstate NY DR page^[50]) - Distribution Load Relief Program (DLRP): \$5.00/kW-month plus \$0.18/kWh, only for customers served by New Krumkill Substation (National Grid DLRP flyer^[51]) National Grid's Dynamic Load Management (DLM) programs, Term-DLM and Auto-DLM, pay only for load relief on the substation and feeders listed in each request for proposals (National Grid DLM RFP 2027^[52])	 Massachusetts: National Grid and Eversource \$200 / kW-summer (National Grid MA ConnectedSolutions^[53]) - ConnectedSolutions daily dispatch for batteries, 30 to 60 events a summer, 2 to 3 hours each (National Grid MA ConnectedSolutions^[53]; Mass Save ConnectedSolutions 2023^[54]) 5-year incentive rate lock for batteries in daily dispatch (Mass Save ConnectedSolutions 2023^[54]) Open to "National Grid electric customers on a commercial electric rate" who pay into the energy efficiency fund (National Grid MA ConnectedSolutions^[53])	 Con Edison, New York City \$6 to \$25 / kW-month (Con Edison Smart Usage Rewards^[55]) - Distribution Load Relief Program (DLRP) reservation: Tier 1 networks \$18, Tier 2 networks \$25, plus \$1/kWh in events (Con Edison Smart Usage Rewards^[55]) - Commercial System Relief Program (CSRP): \$6 to \$18 by location, plus \$1/kWh in events (Con Edison Smart Usage Rewards^[55]) Two programs, two rate scales
 PG&E, Southern California Edison and SDG&E, California \$2 / kWh (CPUC ELRP page^[56]) - Emergency Load Reduction Program for non-residential load cuts, including battery export with permission (CPUC ELRP page^[56]) - Pilot runs through 2027 (CPUC ELRP page^[56]) Pays per event, not per month		

3. Grid services and transmission peaks

Municipal electric utilities show how much a well-timed battery can earn. Sterling Municipal Light Department in Massachusetts installed a 2 MW / 3.9 MWh battery in 2016 for about \$2.7 million. It reports savings of about \$400,000 a year (Sterling MLD fact sheet^[57]). Sandia attributes the value mainly to cutting the

monthly transmission peak and the yearly capacity peak (Sandia SAND2017-1093^[58]). Sandia's study of the site makes the timing plain: the battery has to be *“fully charged and then discharge during the hour of monthly peak load”* (Sandia SAND2017-1093^[58]). The Massachusetts Municipal Wholesale Electric Company (MMWEC) reports \$33.8 million of member savings from peak forecasting and dispatch from 2017 to 2024 (MMWEC energy storage page^[59]).

For federal agencies, the Energy Act of 2020 added *“grid services revenue”* to the list of things that count as energy savings and that may fund an ESPC (42 USC 8287^[7]; 42 USC 8287c^[60]). The statute does not define the term. Whether wholesale capacity and frequency regulation income count is **UNCONFIRMED**; Gaiergy reads the plain words as covering them **GAIERGY VIEW**. FEMP notes that savings from demand response and similar grid-interactive measures *“may be highly variable”* when they depend on utility signals, and suggests a reduced starting guarantee or a contractor reserve account until the savings are proven (FEMP GEB best practices 2024^[61]).

4. Backup power

Resilience is real, but it rarely pays the contract. PNNL: *“resilience improvement measures do not always result in a reduction in energy or water consumption and therefore do not generate utility cost savings which are the primary driver behind performance contracts”* (PNNL-37058^[47]). Federal ESPC law allows *“benefits ancillary”* to energy savings (42 USC 8287^[7]); Gaiergy reads resilience as one **GAIERGY VIEW**. No federal rule was found that lets an agency count a dollar value of avoided outages toward the savings guarantee **UNCONFIRMED**.

Two methods close the gap. Bundling: at the Oklahoma City federal building, pairing grid-interactive measures with fast-payback measures *“helped offset the long payback periods typical of resilience*

technologies” (PNNL-37058^[47]). Mixing money: FEMP says appropriations can be combined with financing for costs that savings cannot carry (FEMP microgrid fact sheet 2025^[62]).

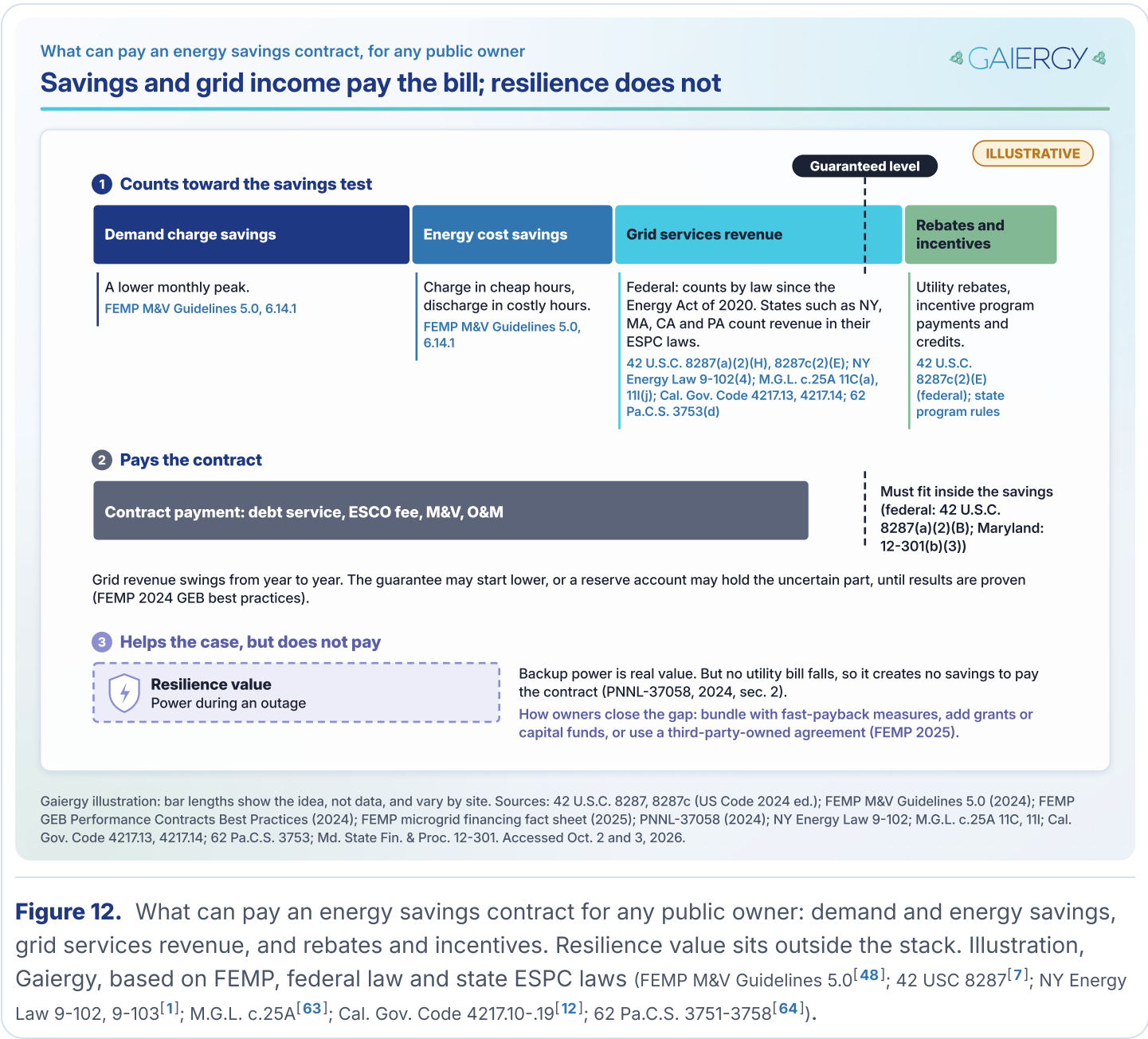




Figure 13. A city campus: the battery sits next to the plant's electric service, where it can cut the plant's peak. Illustration, Gaiergy.

GAIERGY VIEW

Recommendation: size the savings guarantee on what can be measured every month, the demand charge cut and the program payments. Count grid services only after a year of results. Treat backup power as a benefit the community gets, not as a line in the payment plan.

ESPC and UESC side by side, and six other paths

THE ANSWER

An ESPC buys a **guarantee**: an energy service company (ESCO) promises the savings, and most state laws and the federal law build in maintenance and verification. A UESC buys **convenience**: the serving utility designs, finances and builds. **Non-federal owners can use both**. They run ESPCs under state law, and they reach a UESC through three routes: the utility competes as the ESCO, a procurement exemption, or a utility tariff or public power program.

How a city, county, state or school runs an ESPC

Every program found follows the same six steps, whatever the state (DOE ESPC toolkit App. A^[65]; NYSEDA EPC guide 2013^[66]; NJ DCA LFN 2009-11^[67]; Cal. Gov. Code 4217.10-.19^[12]):

1 Governing body decision

A resolution or board vote to pursue the contract. DOE suggests a team from *"administration, finance, legal, procurement, facilities, maintenance"* (DOE ESPC toolkit App. A^[65]).

2 Choose the ESCO

From a pre-qualified state pool or by request for proposals. DOE's model pool runs five years with an annual review (DOE ESPC toolkit App. D^[68]).

3 Investment grade audit

NYSEDA advises having funds for the audit before the request goes out, because the cost *"will not be recovered"* if no project results (NYSEDA EPC guide 2013^[66]).

4 Guaranteed contract plus financing

DOE tells owners to *"Competitively solicit financing"* (DOE ESPC toolkit App. A^[65]). Common forms: lease-purchase, certificates of participation, tax-exempt lease (below).

5 Build and commission

New Jersey asks for an independent review of the system after commissioning (NJ DCA LFN 2009-11^[67]).

6 Measure and verify for the term

NYSEDA points to the latest International Performance Measurement and Verification Protocol (NYSEDA EPC guide 2013^[66]).



Financing forms

- Tax-exempt lease: San Diego, nearly \$112 million over 25 years (City of San Diego EWSPC^[14])
- Certificates of participation: Hawaii's airports, \$167.7 million (Hawaii DOT 2013^[69])
- New Jersey: lease-purchase with the ESCO, a lender, a county improvement authority or the state economic development authority (NJ DCA LFN 2009-11^[67])



Non-appropriation clause

- New York: the contract is executory only to the extent money is appropriated (NY Energy Law 9-102, 9-103^[11])
- Florida: annual renewal *"subject to the agency making sufficient annual appropriations"* (Fla. Stat. 489.145^[70])
- New Jersey energy savings obligations *"do not count against debt limits"* (NJ DCA LFN 2009-11^[67])



State program offices

- Colorado Energy Office: pick a pre-qualified ESCO or procure your own; open to local governments, schools, state agencies and nonprofits (Colorado Energy Office EPC^[71])
- Virginia: statewide pre-qualified ESCO contract through 2029 for *"local and other public bodies"* (Virginia contract E194-82899^[72])
- Washington: an interagency agreement with the Department of Enterprise Services, whose engineers manage the ESCO (WA DES ESPC program^[73])



Model documents

- DOE posts a model request for proposals, ESCO base contract and owner MOU, free to edit (DOE model ESPC documents^[74])
- None of the model documents names batteries; a battery scope, M&V plan and O&M schedule have to be added [GAIERGY VIEW](#)

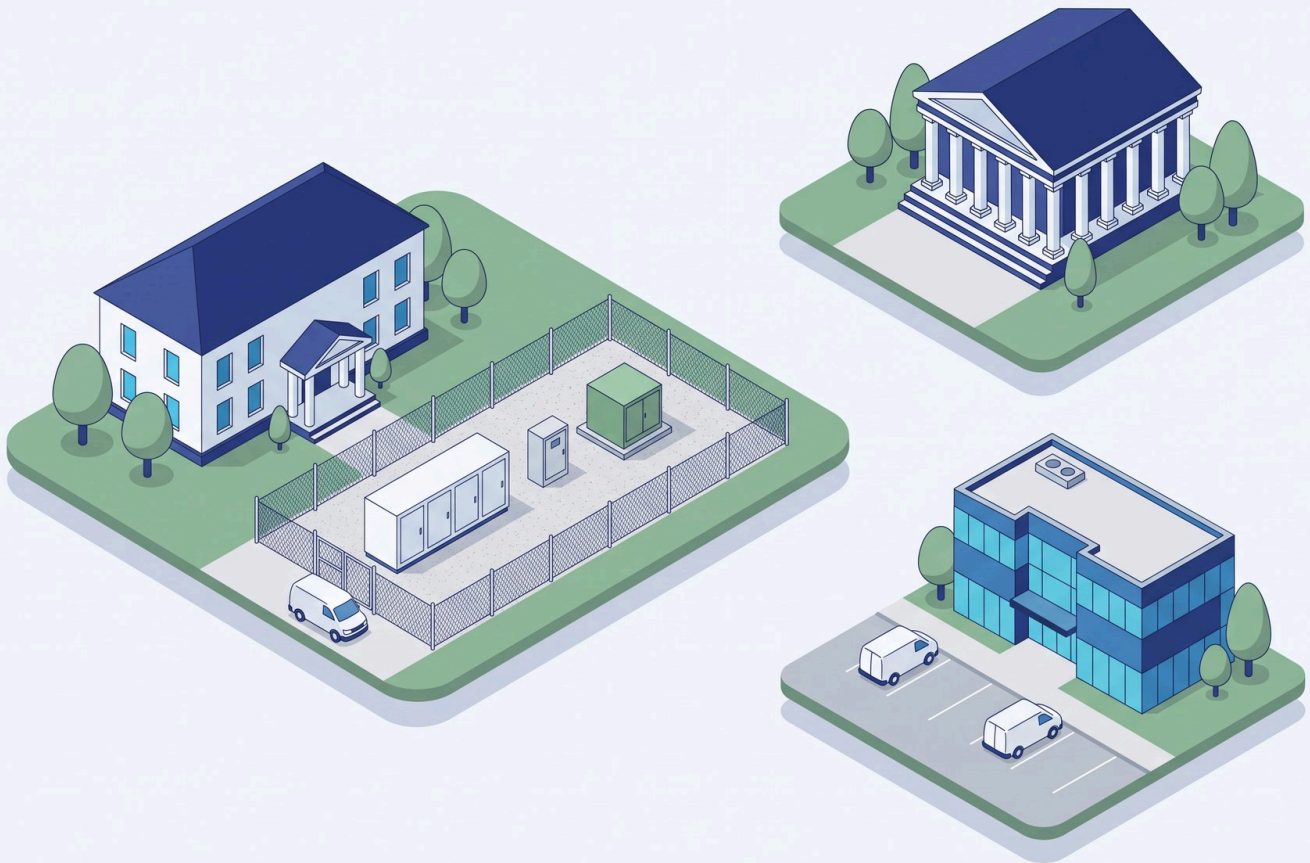
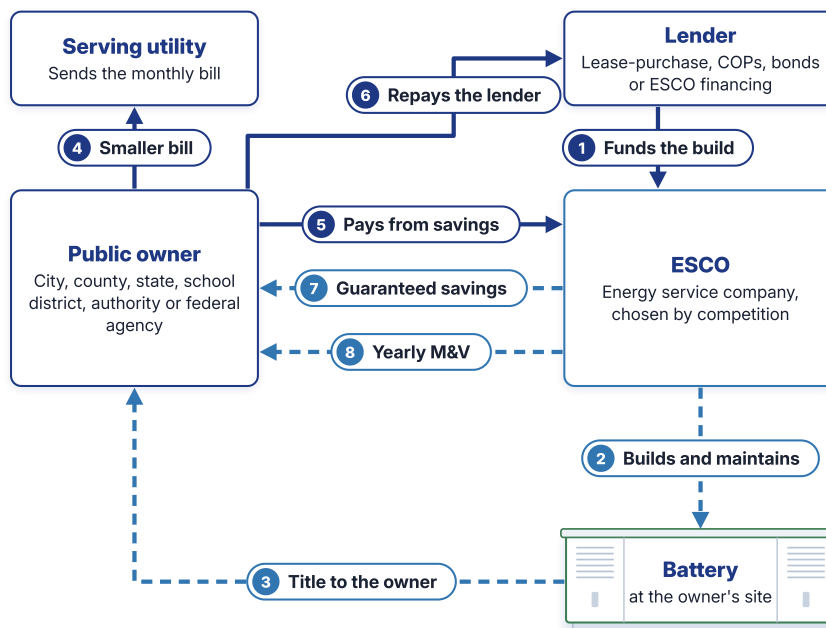


Figure 14. An ESPC: a bank finances, the ESCO builds and maintains the battery, and the public owner pays from the savings. Illustration, Gaiergy.

ESPC: any public owner can pay for a battery from its savings

Energy savings performance contract. Money moves on solid arrows; duties on dashed arrows.

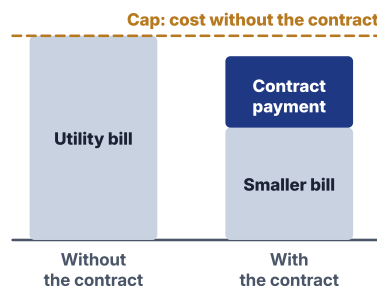


Step by step

- 1 A lender funds the build. Common forms: lease-purchase, certificates of participation (COPs), bonds, or financing the ESCO arranges.
N.J.S.A. 40A:11-4.6; C.R.S. 29-12.5-101(4); Minn. Stat. 16C.144
- 2 The ESCO designs, builds and installs the battery. Federal law makes it maintain and repair it; in the states the contract sets this.
42 U.S.C. 8287(a)(2)(A); state ESPC laws
- 3 The owner takes title: at acceptance (federal), or through lease-purchase or installment purchase (states).
DOE IDIQ ESPC (2023) H.2; 62 Pa.C.S. 3754(c)
- 4 The utility bill falls: lower peak demand and time-of-use charges.
FEMP M&V Guidelines 5.0, Sec. 6.14.1
- 5 The owner pays from the savings. Federal payments may not exceed the cost without the contract. New York requires a non-appropriation clause.
42 U.S.C. 8287(a)(2)(B); NY Energy Law 9-103(2)
- 6 The lender is repaid: by the owner under a lease-purchase, or by the ESCO when the ESCO arranges the financing.
- 7 The ESCO guarantees the savings, under federal law and most state laws.
42 U.S.C. 8287(a)(2)(B); M.G.L. c.25A 11I
- 8 Each year, measurement and verification (M&V) checks the guarantee.
10 CFR 436.37; NJ ESIP third-party verification

The payment rule

ILLUSTRATIVE

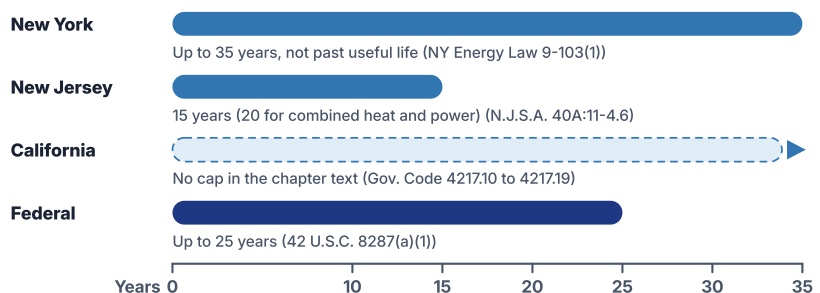


Federal payments may not exceed the utility cost without the contract (42 U.S.C. 8287(a)(2)(B)). States set similar tests; Maryland: payments may not exceed actual savings (12-301(b)(3)). Bar heights are illustrative.

Gaiergy illustration. Sources: 42 U.S.C. 8287 (US Code 2024 ed.); 10 CFR 436 Subpart B; DOE IDIQ ESPC generic contract (2023); FEMP M&V Guidelines 5.0 (2024); NY Energy Law 9-102, 9-103; N.J.S.A. 40A:11-4.6 (ESIP, P.L.2009 c.4); Cal. Gov. Code 4217.10 to 4217.19; 62 Pa.C.S. 3751 to 3758; C.R.S. 29-12.5-101; Md. State Fin. & Proc. 12-301; M.G.L. c.25A 11I. Accessed Oct. 2 and 3, 2026.

How long the contract can run

Federal up to 25 years; states vary. New York, New Jersey and California are the worked examples.



Other states, for example: Pennsylvania 20, Colorado 25, Maryland state agencies 30 (62 Pa.C.S. 3754(c); C.R.S. 29-12.5-101(3)(h); State Fin. & Proc. 12-301(b)(1)).

Figure 15. ESPC money and duties for any public owner: the ESCO finances, builds, maintains and guarantees; the owner pays from savings. Gaiergy graphic.

The federal ESPC: one variant

- **Who pays:** the federal agency, from the energy cost savings. Each year, its payments to the utility and the ESCO together may not exceed what it would have paid for utilities without the contract (42 USC 8287^[7]).
- **Who guarantees:** the ESCO. The contract *“shall provide for a guarantee of savings to the agency”* and an annual energy audit (42 USC 8287^[7]).
- **Who maintains:** the ESCO. The guarantee makes the contractor *“responsible for maintenance and repair services for any energy related equipment, including computer software systems”* (42 USC 8287^[7]).
- **Who owns:** as a general rule, the government takes title after it accepts the equipment (DOE IDIQ ESPC contract 2023^[75]).
- **How long:** up to 25 years under 42 U.S.C. 8287(a)(1) (42 USC 8287^[7]). Each DOE contract task order has a 25-year not-to-exceed term (DOE IDIQ ESPC contract 2023^[75]).
- **How it is bought:** through DOE's indefinite delivery, indefinite quantity (IDIQ) contract, with 21 qualified ESCOs, for projects of \$2 million or more (FEMP ESA FAQ^[76]; FEMP GEB best practices 2024^[61]). The smaller-project ENABLE program was retired in March 2025 (FEMP ESPC ENABLE^[77]).

Scale: from 1997 to 2020, DOE IDIQ ESPCs leveraged \$7.5 billion of investment to save more than \$17 billion in guaranteed cost savings (FEMP ESPC fact sheet^[78]). Oversight matters: the Government Accountability Office found overstated cost and energy savings on 14 of 20 ESPC projects it reviewed in 2015 (GAO-15-432^[79]).

UESCs for non-federal owners

No state has a UESC statute like the federal one [GAIERGY VIEW](#). Non-federal owners reach the same result by three routes (RCW 39.35C^[80]; N.J.S.A. 40A:11-5^[81]; Xcel MN tariff A43^[6]):

ROUTE A



The utility competes as the ESCO

Under the state ESPC law

- Washington: “A local utility shall be offered the initial opportunity to participate in the development of conservation projects”, and storage is named (RCW 39.35C^[80])
- Texas: a provider includes “an affiliate” of an energy services firm (Tex. Local Gov’t Code ch. 302^[82])
- Georgia: proposals from at least two qualified providers (O.C.G.A. 50-37^[83])
- Most other laws define the provider by experience, so a utility affiliate can qualify and then has to win the competition

[GAIERGY VIEW](#)

ROUTE B



A procurement exemption

Buy from the utility or a public power body

- New Jersey: no bidding for “the rendering of any service by a public utility” under tariffs filed with the utility board (N.J.S.A. 40A:11-5^[81]); same rule for boards of education (N.J.S.A. 18A:18A-5^[84]). It fits a battery only if one is offered by tariff; none was found
- [GAIERGY VIEW](#)
- California: Government Code 4217.12 lets a public agency sign an energy service contract after public hearing findings; Berkeley used it without bidding (Cal. Gov. Code 4217.10-.19^[12]; Berkeley Council 2024^[85])
- New York: General Municipal Law 103 has no utility exception (NY GML 103^[86]); a sole source is allowed only under the State Comptroller's sole-source test, where one supplier can meet the need (NY Comptroller procurement guide^[87]), and a battery rarely fits it

[GAIERGY VIEW](#)

ROUTE C



Utility tariff or public power program

The closest UESC look-alike

- Xcel Energy, Minnesota tariff A43: the utility owns and maintains the battery, the customer pays a monthly charge for 10, 15 or 20 years, and title passes to the customer at the end (Xcel MN tariff A43^[6])
- Xcel says the program is open to “commercial, government and industrial customers” in Minnesota and Wisconsin (Xcel Energy 2024^[88])
- Georgia Power's resiliency tariff puts a company-owned resource behind the customer's meter (Georgia PSC 2025^[89])
- Public power: NYPA in New York (NY PAL 1005(17)^[16]); Ava Community Energy in California “sleeves” a developer's power to its cities (Ava Board 2024^[90])



Xcel A43 terms

- \$450 a month program charge for projects that include batteries (Xcel MN tariff A43^[6])
- Annual carrying charge: 15.51% at 10 years, 12.68% at 15, 11.28% at 20 (Xcel MN tariff A43^[6])
- If an asset fails early without warranty or insurance, the customer pays the undepreciated value (Xcel MN tariff A43^[6])



New Jersey: utility-owned at public hosts

- PSE&G owned batteries at a high school, a hospital and a sewage plant under a utility board pilot; host sites lease land or roof (PSE&G to PJM 2018^[91])
- Pennington public works building: 574 kWh with 404 kW of solar (PSE&G 2018, Pennington^[92])
- PSE&G's current on-bill program for public customers lists no storage (PSE&G Engineered Solutions^[93])



New York limits utility ownership

- Public Service Commission, 2015: utility ownership of distributed resources *"will be the exception rather than the rule"* (NY PSC Case 14-M-0101^[94])
- At the customer location, *"utility ownership should not be necessary"* (NY PSC Case 14-M-0101^[94])
- So in New York the working UESC analog is NYPA **GAIERGY VIEW**

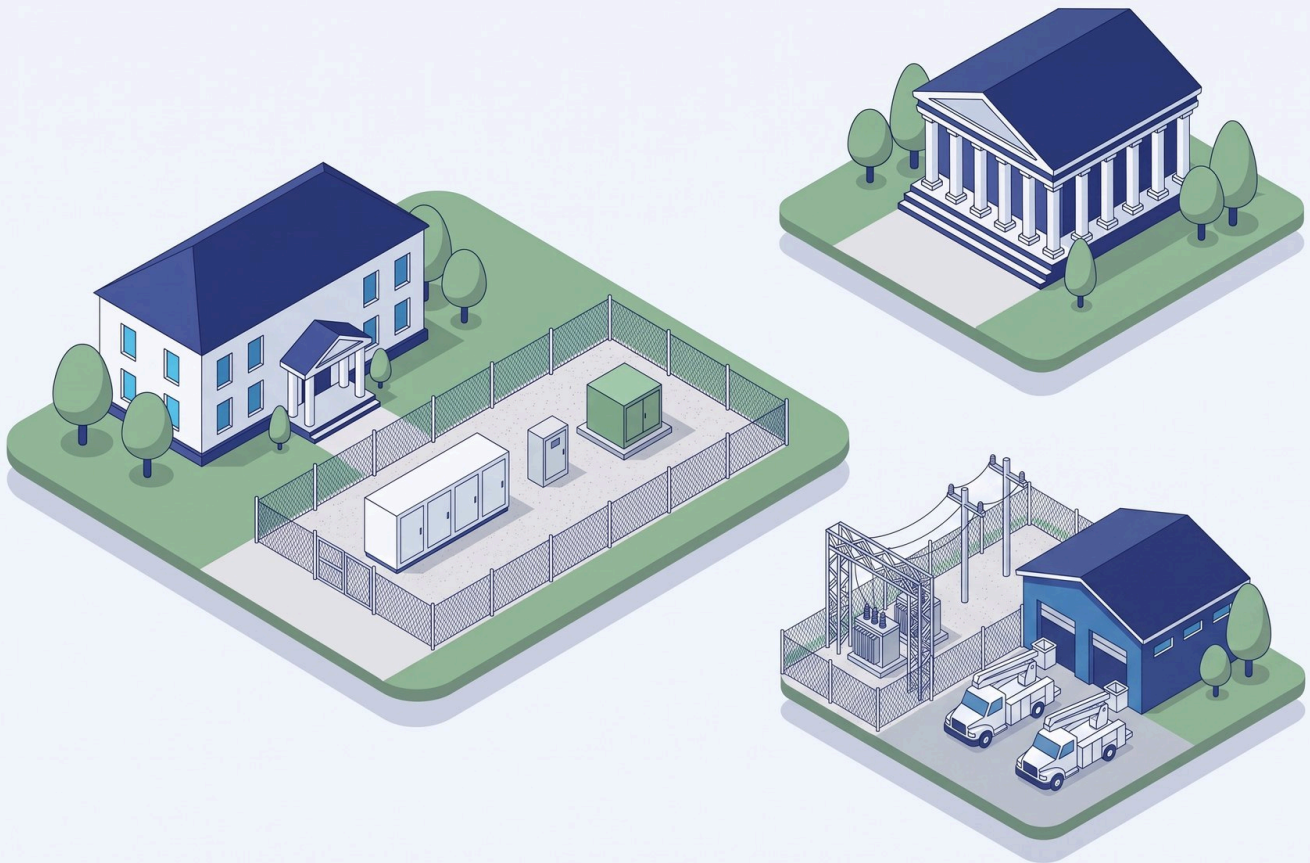


Figure 16. A UESC: the serving utility is the contractor. Nobody is shown maintaining the battery, because under a UESC that duty exists only if the contract says so. Illustration, Gaiergy.

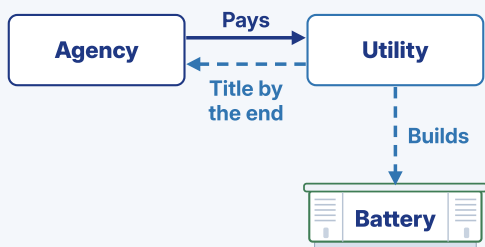
The federal UESC

- **Legal hook:** agencies may join utility programs to increase efficiency or “*manage electricity demand*” and may accept goods and services from the utility (42 USC 8256^[38]). FEMP defines a UESC as a contract for “*measurable energy or water reductions or measurable amounts of demand reduction*” (FEMP UESC FAQ^[95]).
- **Who offers it:** a utility with an exclusive service territory and an obligation to serve (FEMP UESC FAQ^[95]). Usually through a General Services Administration (GSA) areawide contract; about 100 exist (FEMP UESC Basics^[96]; FEMP UESC FAQ^[95]).
- **Who guarantees:** nobody, unless negotiated. A performance assurance plan is required; a savings guarantee is “*not required, negotiable*” (FEMP GEB best practices 2024^[61]).
- **How long:** GSA's position is that UESC terms under an areawide contract may not exceed 25 years (FEMP UESC FAQ^[95]). The statute itself sets no term (42 USC 8256^[38]).
- **Size and storage:** awards range from \$36,000 to over \$100 million (FEMP UESC Basics^[96]). FEMP encourages utilities to include “*onsite generation and storage where cost-effective*” (FEMP UESC Guide 2025^[97]).
- **Speed:** task orders under an areawide contract are an exception to the Competition in Contracting Act (FEMP UESC FAQ^[95]).

UESC: the utility builds and finances the battery

Federal agencies use a UESC statute. Cities, counties, states, schools and nonprofits reach the same result three ways.

FEDERAL Agencies: UESC



No state has a UESC statute

No state law works like 42 U.S.C. 8256. That is why the three routes below exist.

- 1 The authority is 42 U.S.C. 8256(c). The Department of Defense also uses 10 U.S.C. 2913(d).
US Code, 2024 edition
- 2 Orders under a GSA areawide contract are an exception to the Competition in Contracting Act.
FEMP UESC FAQ Q5
- 3 Up to 25 years, the GSA position; the statute sets no maximum.
FEMP UESC FAQ Q7
- 4 Savings guarantee negotiable; a performance assurance plan is required.
FEMP GEB best practices (2024)
- 5 For annual budget scoring the government holds title by the end. DoD title vests in the United States.
FEMP UESC FAQ Q8; 10 U.S.C. 2913(d)(4)

A The utility or its affiliate competes as the ESCO under state ESPC law

No state ESPC law checked names or bars a utility. An affiliate can qualify, then has to win the RFP.

Gaiergy reading

NY Energy Law 9-103 RFP. The PSC lets utility affiliates sell distributed resources under codes of conduct.

NJ ESIP: bid or competitive contracting. A utility is a "commercial entity" (Gaiergy view).

CA Gov. Code 4217: the contractor can be "any person", so a utility or affiliate fits.

Strongest Washington gives the local utility the first offer and names storage (RCW 39.35C.030(2), .140).

B A procurement exemption lets the owner buy from the utility or public power without bidding

The local version of the federal rule that exempts UESC orders from competition.

NY General Municipal Law 103 has no utility exception. Sole source rarely fits a battery (Gaiergy view).

NJ 40A:11-5(1)(f) and 18A:18A-5a(7) cover service under a BPU-filed tariff. No battery tariff is filed today.

CA Gov. Code 4217.12: no bid after a public hearing and a lower-cost finding. Berkeley used it with Ava: 25 years, 387 kWh.

Part 1 of 2; continued in part 2. Gaiergy illustration. Sources: RCW 39.35C.010, .030, .140; Tex. Local Gov't Code 302.001; NY Energy Law 9-103; NY PSC Case 14-M-0101 order (Feb. 26, 2015) pp. 66 to 71; NY GML 103; NY Pub. Auth. Law 1005(17); N.J.S.A. 40A:11-5(1)(f), 18A:18A-5a(7); NJ P.L.2009 c.4 (ESIP); PSE&G Solar 4 All slides to PJM (Mar. 26, 2018); Cal. Gov. Code 4217.10 to 4217.18; City of Berkeley Council Item 15 (Nov. 12, 2024); Ava Community Energy Board Item 16 (Nov. 20, 2024); Xcel Energy MN Rate Book Sec. 5, Sheets 90 to 90.3 (A43); GPSC i2X slides (Dec. 2025); SUNY New Paltz news (2018). Federal: 42 U.S.C. 8256(c); 10 U.S.C. 2913(d); FEMP UESC FAQ Q5, Q7, Q8; FEMP GEB best practices (2024). Accessed Oct. 2 and 3, 2026.

Figure 17. UESC: the utility builds and finances the battery, part 1 of 2. Federal agencies use a UESC statute; cities, counties, states, schools and nonprofits reach the same result three ways. Gaiergy graphic based on federal law, FEMP and the state sources above (42 USC 8256^[38]; FEMP UESC FAQ^[95]; RCW 39.35C^[80]; N.J.S.A. 40A:11-5^[81]; Xcel MN tariff A43^[6]).

UESC, continued: Route C and how the routes differ

Part 2 of 2.

C
A utility tariff or public power program: the utility builds, owns, finances and maintains
The true UESC analog. The owner repays on the bill or to the public power body.

NY NYPA under Pub. Auth. Law 1005(17), up to 35 years (SUNY New Paltz). The PSC limits utility batteries behind the meter.

NJ PSE&G owned batteries at a school, a public works building and a wastewater plant in a 2015 to 2018 pilot paid by all ratepayers.

CA Ava Community Energy, a public agency, sleeves 25-year solar plus storage PPAs for its cities under Gov. Code 4217.

Best model Xcel Resiliency Service, Minnesota tariff A43: monthly charge for 10, 15 or 20 years; title passes to the customer at the end. Georgia Power RAS is similar.

How the routes differ

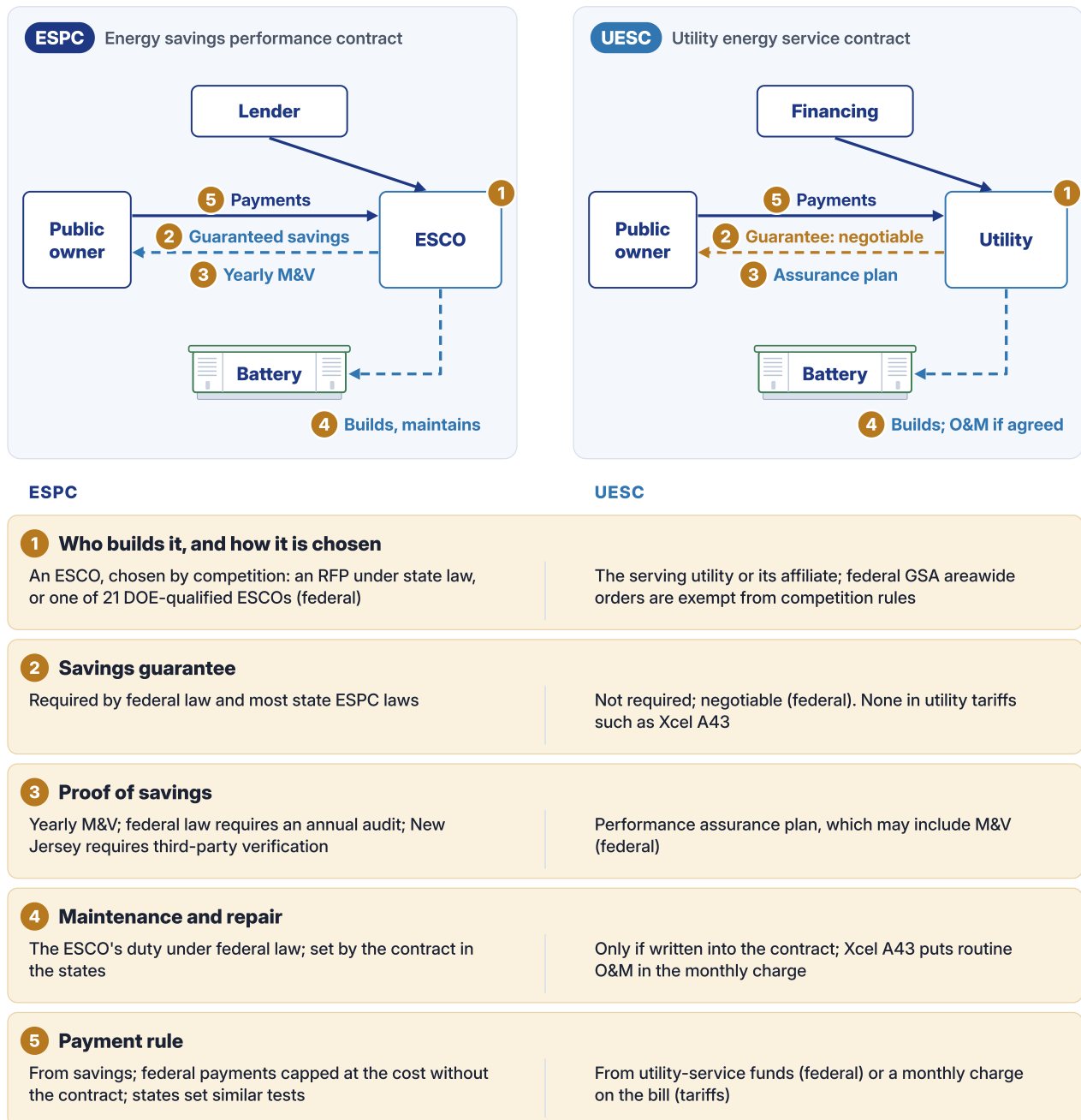
	Federal UESC	Route A	Route B	Route C
Savings guarantee	Not required; negotiable	Required by most state ESPC laws	None in the exemption; CA 4217 needs a lower-cost finding	None in the Xcel tariff or the NYPA statute
Longest term	25 years (GSA)	NY 35, NJ 15, CA no cap in text	CA no cap in text (Berkeley 25); NJ: the tariff term	Xcel 10, 15 or 20; NYPA up to 35
Competition	Exception to the Competition in Contracting Act	Competitive RFP	No bid where the statute applies	Filed tariff, or NYPA and Ava run the competition
Who owns it	Negotiated; government holds title by the end for annual scoring	Owner, usually by installment or lease-purchase	Set by contract (Berkeley: a third party)	Utility during the term; Xcel passes title at the end

Gaiergy illustration. Sources: RCW 39.35C.010, .030, .140; Tex. Local Gov't Code 302.001; NY Energy Law 9-103; NY PSC Case 14-M-0101 order (Feb. 26, 2015) pp. 66 to 71; NY GML 103; NY Pub. Auth. Law 1005(17); N.J.S.A. 40A:11-5(1)(f), 18A:18A-5a(7); NJ P.L.2009 c.4 (ESIP); PSE&G Solar 4 All slides to PJM (Mar. 26, 2018); Cal. Gov. Code 4217.10 to 4217.18; City of Berkeley Council Item 15 (Nov. 12, 2024); Ava Community Energy Board Item 16 (Nov. 20, 2024); Xcel Energy MN Rate Book Sec. 5, Sheets 90 to 90.3 (A43); GPSC i2X slides (Dec. 2025); SUNY New Paltz news (2018). Federal: 42 U.S.C. 8256(c); 10 U.S.C. 2913(d); FEMP UESC FAQ Q5, Q7, Q8; FEMP GEB best practices (2024). Accessed Oct. 2 and 3, 2026.

Figure 18. UESC, continued: Route C, a utility tariff or public power program, and how the routes differ. Gaiergy graphic based on (42 USC 8256^[38]; FEMP UESC FAQ^[95]; RCW 39.35C^[80]; N.J.S.A. 40A:11-5^[81]; Xcel MN tariff A43^[6]).

ESPC and UESC, side by side, for any public owner

Same layout, same job. Amber numbers mark the five differences that matter.



Part 1 of 2; continued in part 2. Gaiergy illustration. Sources: 42 U.S.C. 8287 and 8256(c); FEMP UESC Basics and UESC FAQ Q5, Q7, Q14; FEMP ESA FAQ (21 DOE-qualified ESCOs); FEMP GEB best practices (2024); DOE IDIQ ESPC (2023) Att. J-3 TC.14; NY Energy Law 9-103; N.J.S.A. 40A:11-4.6; Cal. Gov. Code 4217.10 to 4217.19; Fla. Stat. 489.145; RCW 39.35C.140; M.G.L. c.25A 11I; NY Pub. Auth. Law 1005(17); Xcel Energy MN tariff A43 (Sheets 90 to 90.3). Accessed Oct. 2 and 3, 2026.

Figure 19. ESPC and UESC side by side for any public owner. The same layout shows the five differences that matter: who builds and how it is chosen, the savings guarantee, verification, maintenance and payment. Gaiergy graphic.

ESPC and UESC, side by side, continued

Part 2 of 2. The non-federal version, and two rows that apply to both.

ESPC

UESC

NON-FEDERAL Non-federal version

The state's ESPC law, for example NY Energy Law 9-103, NJ ESIP (40A:11-4.6), CA Gov. Code 4217

Three routes: (A) the utility competes as the ESCO; (B) a procurement exemption; (C) a utility tariff or public power (Xcel A43, NYPA)

BOTH Battery allowed?

Yes federally (DOE IDIQ lists battery storage, TC.14); in states where storage, demand or load management is named (FL and WA name storage)

Yes federally (the law covers managing electricity demand); Xcel A43 names battery storage

BOTH Longest term

Federal 25; NY 35; NJ 15 (20 for CHP); CA no cap in text

Federal 25 (GSA position); NYPA up to 35; Xcel 20

Gaiergy illustration. Sources: 42 U.S.C. 8287 and 8256(c); FEMP UESC Basics and UESC FAQ Q5, Q7, Q14; FEMP ESA FAQ (21 DOE-qualified ESCOs); FEMP GEB best practices (2024); DOE IDIQ ESPC (2023) Att. J-3 TC.14; NY Energy Law 9-103; N.J.S.A. 40A:11-4.6; Cal. Gov. Code 4217.10 to 4217.19; Fla. Stat. 489.145; RCW 39.35C.140; M.G.L. c.25A 11i; NY Pub. Auth. Law 1005(17); Xcel Energy MN tariff A43 (Sheets 90 to 90.3). Accessed Oct. 2 and 3, 2026.

Figure 20. ESPC and UESC side by side, continued: the non-federal version of each, and two rows that apply to both. Gaiergy graphic.

The other paths

A public owner can also pay for a battery without carrying it on its own books, or without a savings guarantee. Each path below has a real public example.

Energy sales agreement inside an ESPC



ESCO owns, agency buys the output

- A structure “similar to a power purchase agreement” that uses ESPC authority (FEMP ESA FAQ^[76])
- ESCO owns during the term to capture tax credits; agency takes title at fair market value by the end (FEMP ESA FAQ^[76])
- Typically at least 1 MW (FEMP GEB best practices 2024^[61])
- Batteries allowed with generation, as long as the combined system saves money (FEMP ESA FAQ^[76])

Example: GSA land ports of entry in Texas and New Mexico, awarded a 2020 FEMP grant for solar plus battery under an ESPC energy sales agreement (FEMP AFFECT 2020 list^[98]); built status

UNCONFIRMED

Utility owns, public site hosts



Ratepayers pay

GAIERGY VIEW

- Utility builds, owns and runs the battery on or next to a public site
- The host pays nothing for it, and also does not own it or get the peak savings

Examples: Duke Energy Florida, John Hopkins Middle School: announced 2020, a 2.5 MW battery and 1 MW solar canopy at a special needs shelter (Duke Energy 2020^[99]); in-service date

UNCONFIRMED (Duke Energy 2022^[100]); Green Mountain Power's 4 MW Stafford Hill battery on a closed city landfill, with \$30,600 a year of land rent to Rutland (US EPA 2016, Rutland^[101])

Developer owns: power purchase agreement (PPA), services agreement or energy as a service



Fixed price, no capital

- Developer designs, finances, builds, owns and runs it; the public owner pays a fixed rate
- The developer keeps the tax credit
- Terms in the examples run 20 to 30 years: Montgomery County 25 (Montgomery County Council 2021^[15]), Berkeley 25 (Berkeley Council 2024^[85]), Sonoma State 30 (Sonoma State 2026^[17]), New York City 20 (NYC DCAS 2021^[102])

Examples: Fresno Yosemite Airport, 20-year fixed \$0.2107/kWh under two energy services agreements (Fresno Council ID 26-566^[24]); West Boylston, Massachusetts, a 20-year shared savings contract with no utility capital (MMWEC 2026, West Boylston^[103])

Public authority finances and procures



New York Power Authority (NYPA) model

- NYPA may finance and build energy projects for any New York public entity (NY PAL 1005(17)^[16])
- Terms up to 35 years, capped at useful life (schools: the Education Department maximum); NYPA runs the procurement (NY PAL 1005(17)^[16])

Example: State University of New York (SUNY) New Paltz, solar plus battery for the campus emergency shelter; costs beyond \$461,000 of NYSERDA and Central Hudson funding were *“financed by NYPA and will be repaid by the College”* (SUNY New Paltz News 2018^[104])



On-bill loan

Repay on the utility bill

- PG&E on-bill financing: 0%, up to 120 months, government accounts eligible (PG&E OBF page^[105]; PG&E OBF Handbook 2024^[106])
- Battery storage may use up to 50% of the loan funds, inside an efficiency loan (PG&E OBF Handbook 2024^[106])
- The only on-bill program found that takes a battery today

California rules let other utilities add storage, after each files for it (CPUC D.23-08-026^[107])



Own it outright

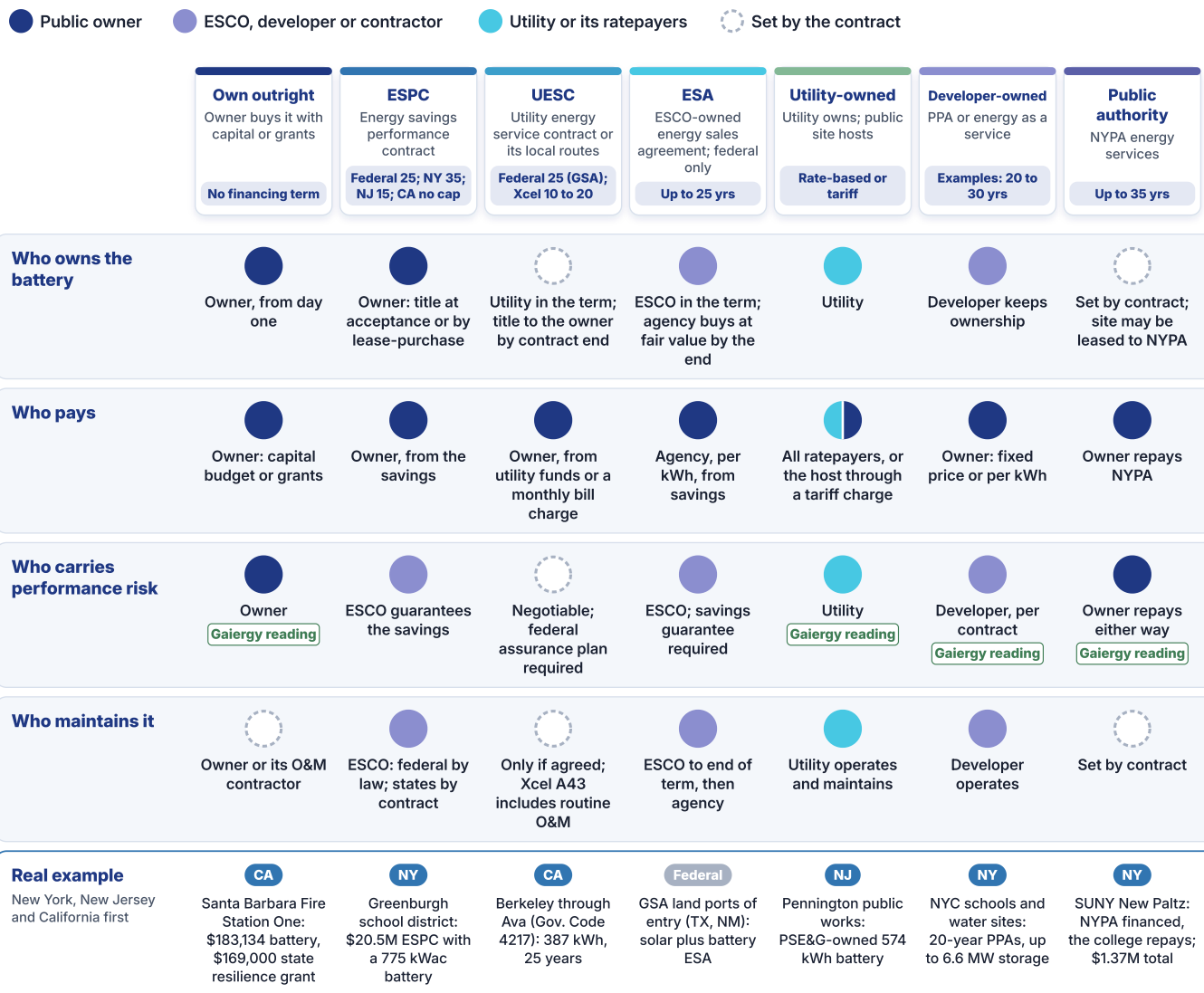
Bonds, grants, cash

- Concord, Massachusetts: the 2024 Special Town Meeting warrant asked to authorize up to \$10.4 million of general obligation bonds for a 4.99 MW / 14.97 MWh battery, repaid first from light plant revenue (Concord 2024 Warrant Art. 1^[108]); vote result **UNCONFIRMED**
- Sterling, Massachusetts: about \$2.7 million battery with state and federal grants (Sterling MLD fact sheet^[57])

The owner carries all O&M unless it buys a service contract

Seven ways to pay for a public battery

Each dot shows who holds the role; the color is the party. A green tag marks Gaiergy's reading.



On-bill loan: a way to pay, not a way to own

PG&E On-Bill Financing lends at 0% for up to 120 months, and a battery can use up to 50% of an efficiency loan. It is the only on-bill program found that takes batteries from public entities.

Gaiergy illustration. Sources: Santa Barbara City Council minutes Nov. 16, 2021 (Fire Station One); RWE release Aug. 27, 2024 (Greenburgh CSD); City of Berkeley Council Item 15, Nov. 12, 2024; GSA Region 7 ESPC ESA (DOE CX-025733); PSE&G news release, May 17, 2018 (Pennington); NYC DCAS release 21-002 (20-year PPAs) and Governor's release Oct. 20, 2021 (up to 6.6 MW storage); SUNY New Paltz news (2018); 42 U.S.C. 8287(a); DOE IDIQ ESPC (2023) H.2; FEMP UESC FAQ Q7, Q8, Q14; FEMP ESA FAQ; Xcel MN tariff A43; NY Energy Law 9-103; N.J.S.A. 40A:11-4.6; Cal. Gov. Code 4217; 62 Pa.C.S. 3754(c); NY Pub. Auth. Law 1005(17); Montgomery County MD and Sonoma State PPAs (25 and 30 years); PG&E On-Bill Financing handbook. Accessed Oct. 2 and 3, 2026.

Figure 21. Seven ways to pay for a public battery: who owns it, who pays, who carries the performance risk, and the usual term. Gaiergy graphic based on the sources in the cards above.

How often ESCOs put batteries in public contracts

The ESCO industry reported \$10.7 billion of revenue in 2024. K-12 schools were \$3.22 billion and state and local government \$1.80 billion (LBNL ESCO report 2026^[109]). On a scale where 1 means never or rarely and 3 means very frequently, ESCOs rated battery storage 1.60 in state and local projects and 1.52 in kindergarten to grade 12 school projects, though LBNL still lists storage among the three most used energy security measures (LBNL ESCO report 2026^[109]). 52% of ESCOs in the public market reported delays due to complex scopes such as microgrids (LBNL ESCO report 2026^[109]).

The law

THE ANSWER

State laws decide what most public owners can do. They were written for lighting and boilers. Of 19 state laws reviewed, **only Florida and Washington name energy storage**, and most others allow a battery only by reading general words broadly **GAIERGY VIEW**. New York allows the longest term, New Jersey has the most checks, and California gives the most freedom. Federal law fits batteries well for federal agencies: up to 25 years under 42 U.S.C. 8287(a)(1).

New York, New Jersey and California: the worked examples

This report's examples come from these three states. The rest of the country has workable laws and paying programs too (Section 7 and the state cards below).



Energy Law 9-102 and 9-103

- State agencies, municipalities, school districts, fire districts and public authorities (NY Energy Law 9-102, 9-103^[1])
- Up to 35 years, not past the equipment's useful life (NY Energy Law 9-102, 9-103^[1])
- Paid from *"a portion of the energy savings or revenues"* (NY Energy Law 9-102, 9-103^[1])
- Contract is executory only to the extent of money appropriated (NY Energy Law 9-102, 9-103^[1])
- May be procured by request for proposals instead of bidding; General Municipal Law 103 and 109-b then do not apply (NY Energy Law 9-102, 9-103^[1])



Schools

- Term: 18 years or the equipment's useful life, whichever is less (8 NYCRR 155.20^[19])
- Commissioner of Education approval before the contract takes effect (8 NYCRR 155.20^[19])
- Separate statement of maintenance and monitoring charges (8 NYCRR 155.20^[19])



NYPA path

- NYPA finances, procures and builds for any public entity, up to 35 years; schools: the Education Department maximum (18 years) (NY PAL 1005(17)^[16]; 8 NYCRR 155.20^[19])
- NYPA's energy efficiency page says it generally works on projects over \$500,000 (NYPA energy efficiency services^[110])
- Funds from NYPA notes, bonds or other NYPA funds (NY PAL 1005(17)^[16])

BATTERIES IN NEW YORK LAW

The Energy Law does not name storage. A battery fits Energy Law 9-102(4) only as equipment that will *"produce energy in connection with"* a facility (NY Energy Law 9-102, 9-103^[1]). NYPA's subdivision 17 does not name storage either, but other parts of section 1005 do: NYPA may build *"energy storage projects"*, and subdivision 27-a covers *"facilities that store and discharge power and energy"* (NY PAL 1005(17)^[16]). Whether subdivision 17's *"clean energy technology"* covers a battery: **GAIERGY VIEW** yes; no agency or court reading was found, **UNCONFIRMED**. NYPA has financed a battery for a public customer in practice (SUNY New Paltz) (SUNY New Paltz News 2018^[104]).

A note on debt: New York General Municipal Law 109-b installment purchases are not debt, but their unpaid payments count as existing indebtedness when testing the debt limit (NY GML 109-b^[111]). An Energy Law contract procured by request for proposals is exempt from 109-b (NY Energy Law 9-102, 9-103^[1]).



Energy Savings Improvement Program

- Local units, boards of education, state agencies and higher education (NJ P.L.2009 c.4; P.L.2012 c.55^[11])
- Lease-purchase up to 15 years, 20 for combined heat and power (NJ P.L.2012 c.55^[27]). What that limit does to a battery, and Gaiergy's recommendation: Section 13.4
- Measures include "demand response equipment"; storage is not named (NJ P.L.2009 c.4; P.L.2012 c.55^[11])
- The utility board markets it as upgrades "without upfront capital expense OR impact to taxpayers" (NJ BPU ESIP memo 2026^[112])



Third parties at every gate

- The audit is not done by the ESCO later hired (NJ P.L.2012 c.55^[27])
- A qualified third party verifies the savings before the governing body adopts the plan; the plan is posted by the utility board (NJ P.L.2012 c.55^[27])
- ESCOs are hired by competitive contracting, not the professional services exception (NJ DCA LFN 2009-11^[67])
- The plan has to "identify maintenance requirements necessary to ensure continued energy savings" (NJ P.L.2012 c.55^[27])



What the financing cannot cover

- Lease-purchase and savings obligations "shall not be used to finance maintenance, guarantees, or verification of guarantees" (NJ P.L.2012 c.55^[27])
- So long-term battery O&M sits in the operating budget or a separate service contract
GAIERGY VIEW
- The utility board opened a docket in May 2026 to revise its request for proposals template (NJ BPU notice 2026^[113]); whether it adds storage is **UNCONFIRMED**



Government Code 4217

- State, counties, cities, districts, school and community college districts and joint powers authorities (Cal. Gov. Code 4217.10-.19^[12])
- Findings at a regularly scheduled public hearing with two weeks' notice: the cost will be less than the anticipated marginal cost of energy (Cal. Gov. Code 4217.10-.19^[12])
- "load management techniques and equipment" count as conservation measures (Cal. Gov. Code 4217.10-.19^[12])



Procurement

- An agency "may request proposals" and award on experience, technology and cost (Cal. Gov. Code 4217.10-.19^[12])
- It may use a pool of qualified ESCOs under Public Utilities Code 388; state agency contracts can run up to 35 years (Cal. Pub. Util. Code 388^[114])
- Berkeley signed a 25-year solar plus storage agreement under 4217 without bidding (Berkeley Council 2024^[85])



Joining forces

- Two or more public agencies may jointly exercise any common power through a joint powers authority (Cal. Gov. Code 6502^[115])
- A joint powers authority lets several small cities run one battery procurement together
GAIERGY VIEW

All 19 states reviewed

Each card shows the statute, the longest term, and whether the law names storage, names peak demand or demand response, or lets market or utility revenue count. A gray chip means the text read does not say it.

The governing sections were read on official legislature or code sites, or on Westlaw's public site for Maryland and New York schools. For NYPA, only the relevant subdivisions of section 1005 were read.

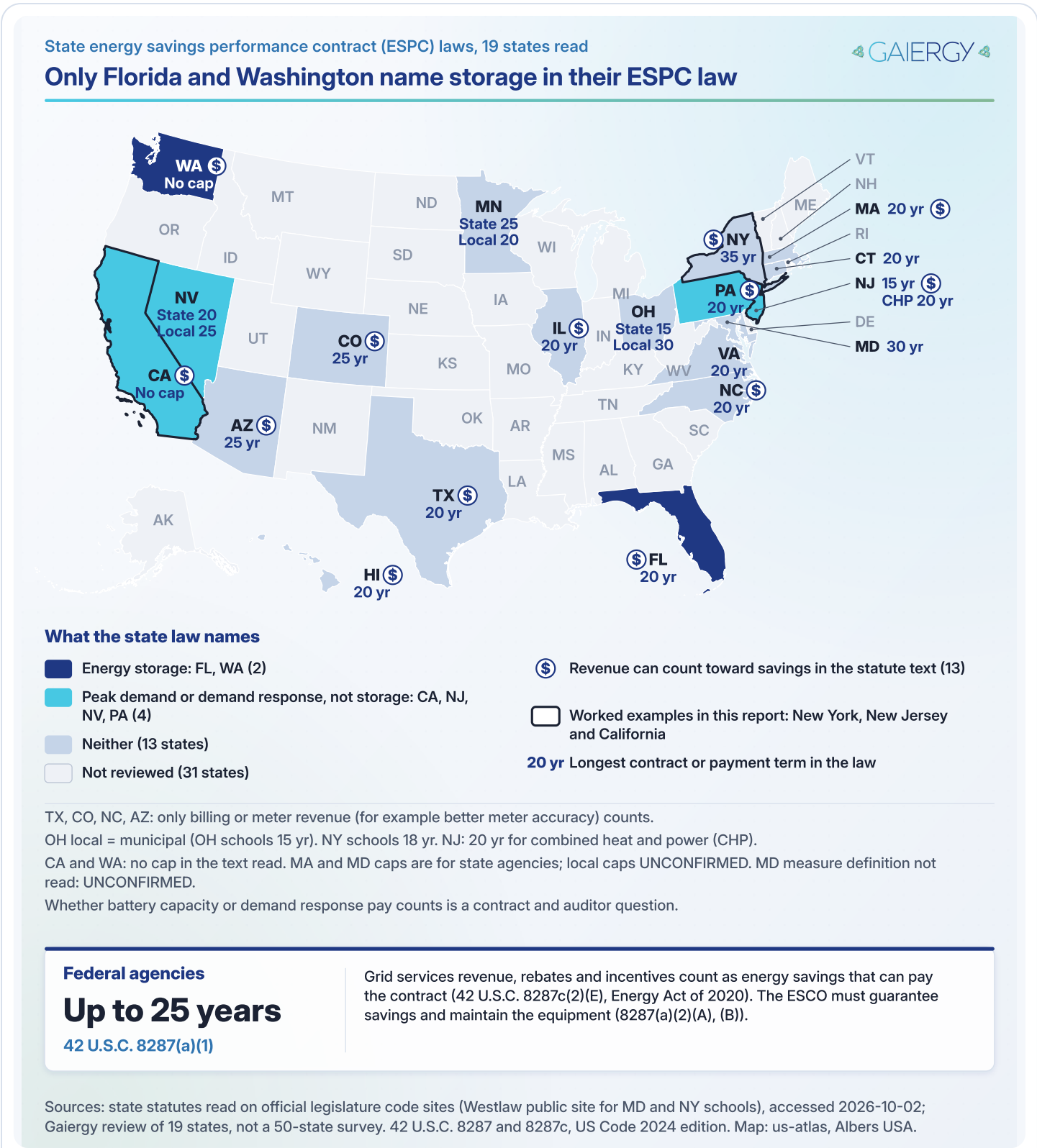


Figure 22. What state ESPC laws say about batteries. Florida and Washington name storage. Where a cap is stated, terms run from 15 to 35 years; California and Washington state none in the text read.

Gaiergy graphic based on the statutes cited in the state cards.

Card chips:  Names storage  Names peak demand or demand response  Counts revenue
 Not in the text read

Revenue is marked on wherever the law lets any revenue count, including billable revenue from better meters.

Florida

20 years

Storage Demand Revenue

Lists “Energy storage systems” and “demand response programs”; repayment from complete installation and acceptance (Fla. Stat. 489.145^[70])

Washington

No cap in text read

Storage Demand Revenue

Distributed resources include “energy storage, demand response”; utility or Bonneville payments count, and energy savings may be sold to the local utility; energy as a service allowed until June 30, 2033 (RCW 39.35C^[80])

Pennsylvania

20 years

Storage Demand Revenue

“load shifting to reduce peak demand”; revenue increases count toward the guarantee (62 Pa.C.S. 3751-3758^[64])

New Jersey

15 years (20 for combined heat and power) (NJ P.L.2012 c.55^[27])

Storage Demand Revenue

Measures include “demand response equipment”; plan lists PJM Interconnection (PJM) demand response revenue (NJ P.L.2009 c.4; P.L.2012 c.55^[11]). Term runs from completion of the measures (NJ P.L.2012 c.55^[27]). Whether a later amendment changed the term

UNCONFIRMED

California

No cap in chapter

Storage Demand Revenue

“load management techniques and equipment”; may sell “electrical generating capacity” (Cal. Gov. Code 4217.10-.19^[12])

Nevada

Local 25, state 20

Storage Demand Revenue

State law reaches costs of “electrical energy and demand”; state term 20 years after construction is completed (NRS 333A^[116]); local up to 25 years (NRS 332; NRS 333A^[117])

New York

35 years

Storage Demand Revenue

Paid from “energy savings or revenues”; capped at useful life; schools 18 years (NY Energy Law 9-102, 9-103^[1]; 8 NYCRR 155.20^[19])

Massachusetts

State 20; local

UNCONFIRMED

Storage Demand Revenue

Payments may rest on “revenues gained due to the contractor’s services”; measurement and verification (M&V) to FEMP standards (M.G.L. c.25A^[63])

Hawaii

20 years

Storage Demand Revenue

Paid from “cost savings, lease payments, or specified revenues”; ESCO pays shortfalls in 30 days (HRS 36-41^[118])

Illinois

20 years

Storage

Demand

Revenue

Savings may include renewable energy credits and carbon credits; valid without a prior appropriation (50 ILCS 515^[119])

Maryland

30 years (state)

Storage

Demand

Revenue

State units; measure definition and local law **UNCONFIRMED** (Md. SFP 12-301^[120])

Colorado

25 years

Storage

Demand

Revenue

Not debt under constitutional or home rule limits, up to a set share of assessed value; a meter guarantee counts billable revenue (C.R.S. 29-12.5^[121])

Arizona

25 years

Storage

Demand

Revenue

Shortest of useful life, financing term or 25 years; revenue from improved meters counts; M&V per the International Performance Measurement and Verification Protocol (IPMVP) or FEMP (A.R.S. 34-105^[122])

Minnesota

State 25; local 20

Storage

Demand

Revenue

Both from final installation (Minn. Stat. 16C.144^[123]; Minn. Stat. 471.345^[124])

Ohio

Local 30; state and schools 15

Storage

Demand

Revenue

Municipal: lesser of system life or 30 years (ORC 717.02^[125]). State: 15 years, 20 for cogeneration (ORC 156.04^[126])

Texas

20 years

Storage

Demand

Revenue

Independent engineer reviews savings before signing; billable revenue gains count (Tex. Local Gov't Code ch. 302^[82])

North Carolina

20 years

Storage

Demand

Revenue

From installation and acceptance; measures may "capture lost revenue" (N.C.G.S. 143-64.17^[127])

Connecticut

20 years

Storage

Demand

Revenue

Term and package payback both capped at 20 years (C.G.S. 16a-37x^[128])

Virginia

20 years

Storage

Demand

Revenue

100% performance guarantee bond; annual reconciliation (Va. Code 45.2-1702^[129])

Revenue language in most of these laws was written for meters or generation. Whether a capacity or demand response payment from a battery counts toward a guarantee is a contract and auditor question that these texts do not settle **GAIERGY VIEW**.

Federal law



42 U.S.C. 8287: the ESPC

- Contracts *“solely for the purpose of achieving energy savings and benefits ancillary to that purpose”* (42 USC 8287^[7])
- Up to 25 years under 8287(a)(1) (42 USC 8287^[7])
- An agency may not set a policy that limits the term to less than 25 years (42 USC 8287^[7])
- Grid services revenue, incentives, rebates and credits may fund the contract (Energy Act of 2020) (42 USC 8287^[7])
- Agencies may not limit recognition of O&M savings (42 USC 8287^[7])



Is a battery an energy conservation measure?

- Statute: measures that *“improve energy efficiency”* and involve, among others, *“energy consuming devices and required support structures”* (added in 2020) (42 USC 8259^[130])
- FEMP: efficiency can be improved by *“managing electricity load through the use of batteries”* (FEMP ESPC scope FAQ 2022^[8])
- The DOE IDIQ contract lists *“Battery energy storage”* under peak shaving and load shifting (DOE IDIQ ESPC contract 2023^[75])
- Equipment on the ground, not on a building, still counts as *“applied to a Federal building”* (FEMP ESPC scope FAQ 2022^[8])



Long payback is allowed if the whole contract pays back

- A measure that alone would not pay back in 25 years *“is permissible only if the ESPC as a whole has a payback period within the twenty-five-year contract period”* (FEMP ESPC scope FAQ 2022^[8])
- Agencies *“shall use performance contracting”* for at least 50% of the measures found in facility evaluations (42 USC 8253^[131])



Defense rules

- DoD is directed to consider bundling quick-payback measures with resilience projects, counting ESPC and UESC funding (10 USC 2911^[132])
- By fiscal 2030, critical mission loads at 99.9% availability (10 USC 2920^[133])
- Defense UESCs: equipment title vests in the United States (10 USC 2913^[134])

One regulation lags the statute. The DOE rule at 10 CFR 436.31 still reads *“applied to an existing Federally owned building or facility”* and lacks the 2020 wording (10 CFR 436 Subpart B^[135]). The same rule says its permissive terms *“shall be liberally construed”*, and FEMP applies the broader statute (10 CFR 436 Subpart B^[135]; FEMP ESPC scope FAQ 2022^[8]). Gaiergy reads the statute as controlling where the two differ

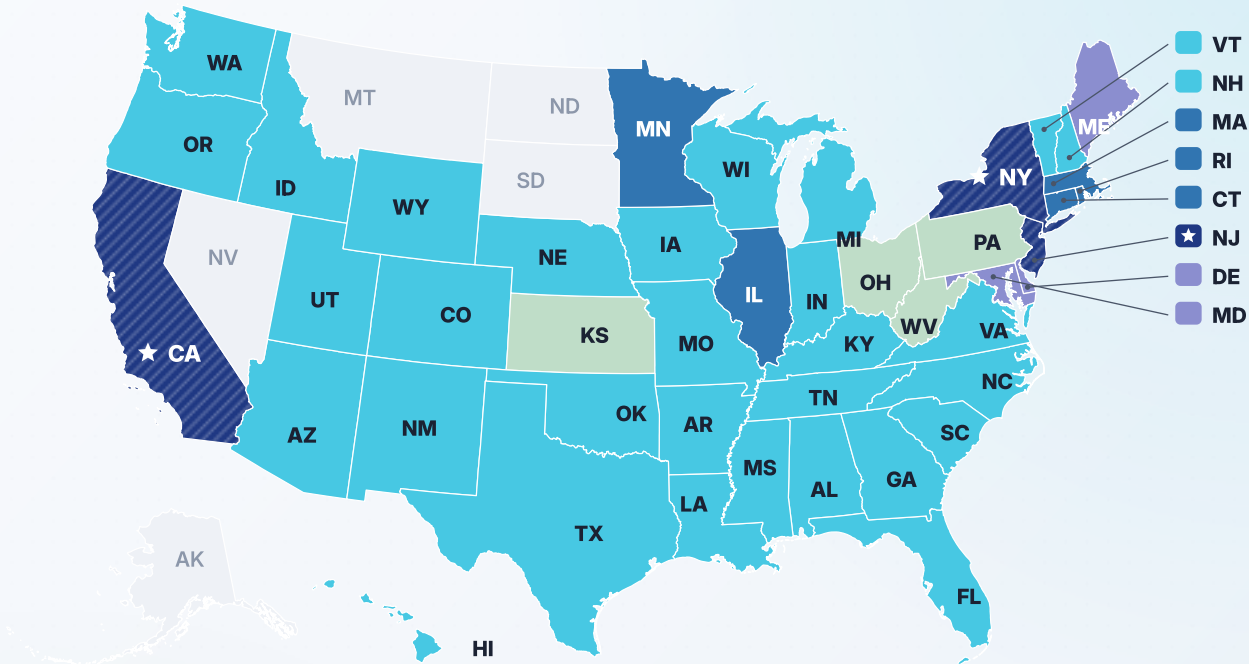
GAIERGY VIEW .

Beyond New York, New Jersey and California

THE ANSWER

The worked examples in this report come from three states, but **batteries can pay their way far beyond them**. In 42 of the other 47 states, Gaiergy found at least one open state incentive, utility program or wholesale market that a commercial account can join (Gaiergy review of state energy office, utility, regulator and grid operator pages, October 3, 2026).

Batteries can pay their way far beyond our three example states



What a public battery host can earn

- ★ Worked examples in this report: NY, NJ, CA
- State incentive only (3 states)
- Wholesale market access only (4 states, plus DC)
- State incentive and utility program (5 states)
- Utility program only (30 states)
- Not enough verified yet (5 states)

What a public battery can earn outside our three states: examples

- | | |
|--|---|
| <p>MA ConnectedSolutions pays \$200 per kW each summer for daily battery dispatch</p> <p>IL Utility rebate of \$250 per kWh for storage with on-site renewables</p> <p>SC Duke PowerShare Storage, open to government: \$120 per kW once, then \$3.50 per kW a month</p> <p>TX ERCOT market serves about 90% of state load; Oncor pays up to \$35 per kW</p> | <p>CT Energy Storage Solutions pays \$325 per kW a year for 5 years, then \$175</p> <p>ME Efficiency Maine pays \$200 per kW a year on 5-year contracts</p> <p>NE OPPD pays \$4.60 per kW a month for stored energy on call</p> <p>UT Rocky Mountain Power pays \$200 per kW for business batteries (also ID, WY)</p> |
|--|---|

Sources: state energy office, PUC, utility and ISO pages (see source list), accessed 2026-10-03; 26 U.S.C. 6417 and 48E; utility program pages for each example. Map: us-atlas, Albers USA.

Figure 23. What can pay a public or nonprofit battery host, state by state, with one strong example per region. Gaiergy graphic from program pages accessed 2026-10-03 and EIA-860M; sources for each example are in the cards below.

One strong example per region



Massachusetts

New England

\$200 per kW each summer

National Grid ConnectedSolutions pays business batteries on daily dispatch, 30 to 60 summer events (National Grid MA ConnectedSolutions^[53])



Connecticut

New England

\$325 per kW a year

Energy Storage Solutions: \$325 per kW for years 1 to 5, then \$175 for years 6 to 10, small and medium business class; the battery discharges on a set schedule each summer (Energy Storage Solutions, April 1, 2026 changes^[136])



Maine

New England

\$200 per kW a year

Efficiency Maine pays \$200 per kW a year on five-year contracts for battery output at the summer peak; applications July 1, 2026 to June 30, 2027 (Efficiency Maine PON EM-003-2027^[137]; Efficiency Maine ESS summary^[138]). Town and school eligibility **UNCONFIRMED**



Illinois

Midwest

\$250 per kWh, once

ComEd rebate for a storage device paired with on-site solar at a business site over 100 kW (ComEd DG rebate page^[139])



Nebraska

Great Plains

\$4.60 per kW a month

Omaha Public Power District pays any commercial customer with "stored energy" of 100 kW or more, plus \$0.25 per kWh during events (OPPD Business Curtailment^[140])



South Carolina

Southeast

\$120 per kW, then \$3.50 a month

Duke Energy PowerShare Storage is open to "government and other nonresidential participants": a one-time \$120 per kW credit, then \$3.50 per kW each month (Duke Energy release, PowerShare Storage SC^[141])



Texas

ERCOT

Up to \$35 per kW

ERCOT carries about 90% of the state's load (ERCOT, About^[142]). Oncor's 2026 load management program pays up to \$35 per kW of summer peak reduction; batteries are not named **UNCONFIRMED** (Oncor 2026 Commercial Load Management manual^[143])



Utah, Idaho, Wyoming

Mountain West

\$200 per kW

Rocky Mountain Power Wattsmart Battery: business batteries over 30 kW get a custom offer letter (Rocky Mountain Power Wattsmart Battery^[144]). Government account eligibility

UNCONFIRMED

Four facts that hold in every state

Across the whole country



Four national facts that help any public battery pay its way

Direct pay 26 U.S.C. 6417 and 48E

Cities, counties, schools, agencies and nonprofits can take the battery tax credit as cash. Full credit for construction that starts through 2033.

5 million Demand charges

Nearly 5 million commercial customers can be on tariffs with demand charges over \$15 per kW. These tariffs cover public buildings too (NREL, 2017).

2 of 3 Wholesale markets

About two thirds of US consumers are served through ISO or RTO markets. FERC Order 2222 lets groups of small resources take part (minimum size 100 kW or less).

42 states Batteries operate

54 GW of utility-scale batteries run in 42 states. Texas has 18.4 GW and Arizona 6.6 GW (EIA-860M, August 2026).

Sources: 26 U.S.C. 6417 and 48E; FERC Order 2222 fact sheet; FERC Office of Public Participation, Energy Markets; NREL/BR-6A20-68963 (2017); EIA-860M, August 2026 (Gaiergy tally of operating batteries). Accessed 2026-10-03.

Figure 24. Four facts that hold in every state. The 54 GW in 42 states is Gaiergy's sum of EIA data for August 2026, not an EIA total. Gaiergy graphic based on (26 USC 6417^[36]; IRS elective pay FAQ^[145]; 26 CFR 1.6417-2^[146]; 26 USC 48E^[147]; 26 USC 45Y^[148]; FERC, Energy Markets^[149]; FERC Order No. 2222 fact sheet^[150]; NREL/BR-6A20-68963^[10]; EIA-860M, August 2026^[151]).

CHECK ELIGIBILITY FIRST

- Several of these programs do not name cities, schools or other public owners. Efficiency Maine asks for “a business in good standing” (Efficiency Maine PON EM-003-2027^[137]); Rocky Mountain Power's page speaks of commercial batteries (Rocky Mountain Power Wattsmart Battery^[144]). Recommendation: confirm with the program office before counting a city, school or authority as eligible.
- Many utility demand response programs reviewed do not say whether a battery may take part (Gaiergy review, October 2026).
- Some money is not open yet. Texas adopted a backup power grant rule, effective May 27, 2026, that covers public schools, libraries and town halls at up to \$500 per kW (16 TAC 25.513^[152]); application opening date **UNCONFIRMED** (PUCT Texas Energy Fund page^[153]).
- Rates are as published on October 3, 2026 and change from year to year.

GAIERGY VIEW

No state is a dead end. Where a state has no battery incentive, a utility peak program, a wholesale market or direct pay of the federal credit can still carry part of the cost, and an energy contract can

pair the battery with savings measures the law already names (Section 6). Recommendation: consider checking all four before deciding a battery will not work in your state.

Airports are different

THE ANSWER

An airport can use the same contracts as a city. Three federal rules change the deal. **Airport money stays at the airport. Airport land earns fair market rent. Federal grants now name storage, with conditions.** In October 2025 the FAA moved to cancel one \$6.7 million grant to Indianapolis International Airport for a solar array with battery storage; the airport later confirmed the grant was rescinded and never received (press reports). The FAA's airport grant programs themselves remain open.

Rule 1: airport revenue stays at the airport

An airport that takes federal grants gives a written assurance that its revenues “*will be expended for the capital or operating costs of*” the airport, the local airport system, or other local facilities tied to air transportation (49 USC 47107^[23]). The same limit applies to any airport that is the subject of federal assistance (49 USC 47133^[154]). The Federal Aviation Administration (FAA) bars payments that “*exceed the fair and reasonable value*” of services provided to the airport (FAA revenue use policy 1999^[155]).



Paying an ESCO or developer

Airport revenue can pay for power, savings or resilience used at the airport. Keep the price defensible as fair value; a competitive procurement is the usual proof

GAIERGY VIEW



A city-wide ESPC that includes the airport

Airport revenue pays only the airport's share, so a pooled contract needs a written split by facility

GAIERGY VIEW. Hawaii's airports used a separate airports contract financed with \$167.7 million of certificates of participation (Hawaii DOT 2013^[69]).



Grid income from an airport-owned battery

Revenue from a sponsor's own activity on airport property is airport revenue (FAA revenue use policy 1999^[155]). So battery market income stays in the airport system **GAIERGY VIEW**.

Rule 2: airport land earns fair market rent

The FAA reads the self-sustaining assurance to mean the airport “*receive fair market value for the provision of nonaeronautical facilities and services*” (FAA revenue use policy 1999^[155]; 49 USC 47107^[23]). At California Redwood Coast-Humboldt County Airport, the FAA had to approve the ground lease and release 11.1 acres for nonaeronautical use. It approved on March 2, 2021. The rent was paid in kind: a 300 kW net-metered solar array was estimated, when the lease was negotiated, to save the county more than \$44,000 a year, which was “*shown to be equivalent to the fair market value of the lease*” (CEC-500-2026-006^[156]).

Rule 3: federal grants now name storage, with conditions



Airport Improvement Program (AIP)

- The FAA Reauthorization Act of 2024 added “renewable energy generation and storage infrastructure” to the airport power supply and microgrid category of airport development (49 USC 47102^[157])
- A battery can be eligible on its own for power supply and redundancy, if it is justified and is a “usable unit of work”. To count as part of a microgrid, a stand-alone battery links to an existing generator or is bought in the same project that makes a working microgrid (FAA R-PGL 25-02^[158])
- Tenant share, such as rental car facilities, is prorated out (FAA R-PGL 25-02^[158])
- Substation upgrades qualify only at on-airport, airport-owned substations (FAA R-PGL 25-02^[158])



Money and paperwork

- The discretionary set aside uses at least 35% of the discretionary fund, up to \$200 million a year, in fiscal 2025 to 2028, and energy projects can compete for it (FAA R-PGL 25-02^[158])
- An energy assessment under 49 U.S.C. 47140 is needed only when the project serves demand more than five years out (FAA R-PGL 25-06^[159]; 49 USC 47140^[160])
- The AIP Handbook in force (2019) has no battery language (FAA Order 5100.38D Chg 1^[161]). FAA expects the final rewritten handbook in summer 2027 (FAA page, accessed 2026-10-02) (FAA draft AIP Handbook page^[162])



Other FAA programs

- Voluntary Airport Low Emissions (VALE): now open to all commercial service airports (FAA R-PGL 25-02^[158]), though the FAA page still says nonattainment areas only (FAA VALE page^[163]). No battery category found **UNCONFIRMED**
- Zero emission vehicle pilot: covers chargers, not stationary storage (FAA ZEV guidance v2^[164])
- Airport Infrastructure Grants: \$14.5 billion over five years; fiscal 2026 is the final \$2.89 billion (FAA AIG page^[165]). Battery eligibility follows the FAA's broader reading **GAIERGY VIEW**



AIP is open and awarding in 2026

- Congress provided \$4.0 billion of regular AIP funding in February 2026 (AAAE, May 12, 2026^[166])
- Award rounds in fiscal 2026: May 12 (over \$653 million) (AAAE, May 12, 2026^[166]), July 1 (about \$1.1 billion) (AAAE, July 1, 2026^[167]), August 20 (nearly \$615 million) (FAA, August 20, 2026^[168]) and September 25 (\$84.4 million) (FAA, September 25, 2026^[169])
- Batteries qualify through AIP's project definition: “renewable energy generation and storage infrastructure” and a “microgrid” (49 USC 47102^[157])



Airport Safety and Resilient Infrastructure Discretionary Program (ASRID)

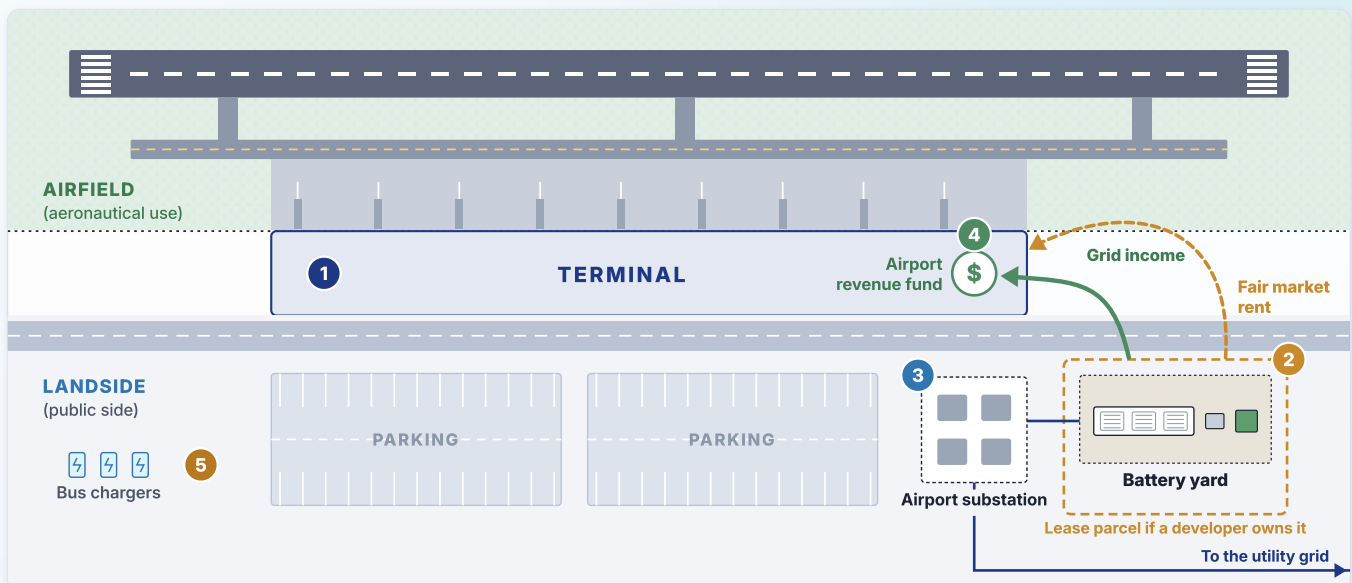
- A discretionary program inside AIP, 49 U.S.C. 47115(j), named by Pub. L. 118-63 section 714(a) (49 USC 47115^[170])
- Authorized at \$200 million a year for fiscal 2025 to 2028; an authorization, not an appropriation (49 USC 47115^[170])
- The fiscal 2025 supplemental of about \$50 million runs under ASRID rules and is available through fiscal 2027 (FAA AIP supplemental 2025 to 2027^[171]). Whether ASRID received fiscal 2026 funding: **UNCONFIRMED**
- Its own text targets flood resilience and runway safety (49 USC 47115^[170]); a battery's eligibility comes from the AIP definition above



One canceled grant, not the programs

- In October 2025 the FAA moved to cancel one \$6.7 million grant to Indianapolis International Airport for a solar array with battery storage **PRESS ONLY** (Fox59 2025^[172]). The grant came from the FAA's fiscal 2023 AIP supplemental (FAA FY23 AIP Supplemental list^[173])
- The airport later confirmed the grant was rescinded and never received **PRESS ONLY** (IndyStar, October 2025^[174])
- The FAA's airport grant programs themselves remain open (AAAE, May 12, 2026^[166]; FAA, September 25, 2026^[169])

At an airport, battery money stays inside the airport



1 Airport revenue pays airport costs

Airport revenue may pay the airport's own capital and operating costs, so it can pay an ESCO or energy provider. Payments above fair and reasonable value are barred.

49 U.S.C. 47107(b)(1); FAA Revenue Use Policy, 64 FR 7696 (1999), VI.B.1

2 Leased land earns fair market rent

If a developer owns the battery on airport land, the airport must get fair market value, cash or in kind. The FAA may have to approve the lease and release the land. Redwood Coast (ACV): FAA released 11.1 acres on March 2, 2021.

Policy VII.C and VI.B.8; CEC-500-2026-006, pp. 15-16, 65-66

3 AIP grants now cover storage

AIP covers storage since the 2024 Act. A stand-alone battery qualifies only where it links to existing generation or completes a usable microgrid. Substation work qualifies only at airport-owned, on-airport substations. Tenant share is prorated.

49 U.S.C. 47102(3)(P), Pub. L. 118-63 sec. 702; FAA R-PGL 25-02 (April 4, 2025), pp. 6-7

4 Grid income stays in the airport

Money an airport-owned battery earns from the grid is airport revenue. It must be spent on the airport, not sent to the city or county general fund (Gaergy reading of the Policy definition).

Policy II.B; 49 U.S.C. 47107(b) and 47133

5 VALE and ZEV pilot: limits

VALE: FAA's own VALE pages list no stationary battery category (UNCONFIRMED either way). ZEV pilot: pays for zero-emission vehicles and their chargers, not major substation upgrades. Stationary batteries are not listed.

FAA VALE brochure (updated 2026-03); 49 U.S.C. 47136; FAA ZEV Technical Guidance v2 (2022), sec. 5.0

Sources: 49 U.S.C. 47102, 47107, 47133, 47136 (US Code 2024 edition, govinfo.gov); FAA Policy and Procedures Concerning the Use of Airport Revenue, 64 FR 7696; FAA R-PGL 25-02; FAA VALE pages and ZEV guidance; CEC-500-2026-006 (Redwood Coast Airport Microgrid). All accessed 2026-10-02. Diagram is schematic, not a real airport.

Figure 25. The airport money rules in one picture: revenue use, land rent and grant eligibility. Gaergy graphic based on 49 U.S.C. 47107 and 47102, the FAA revenue policy and FAA Reauthorization Program Guidance Letter (R-PGL) 25-02 (49 USC 47107^[23]; 49 USC 47102^[157]; FAA revenue use policy 1999^[155]; FAA R-PGL 25-02^[158]).

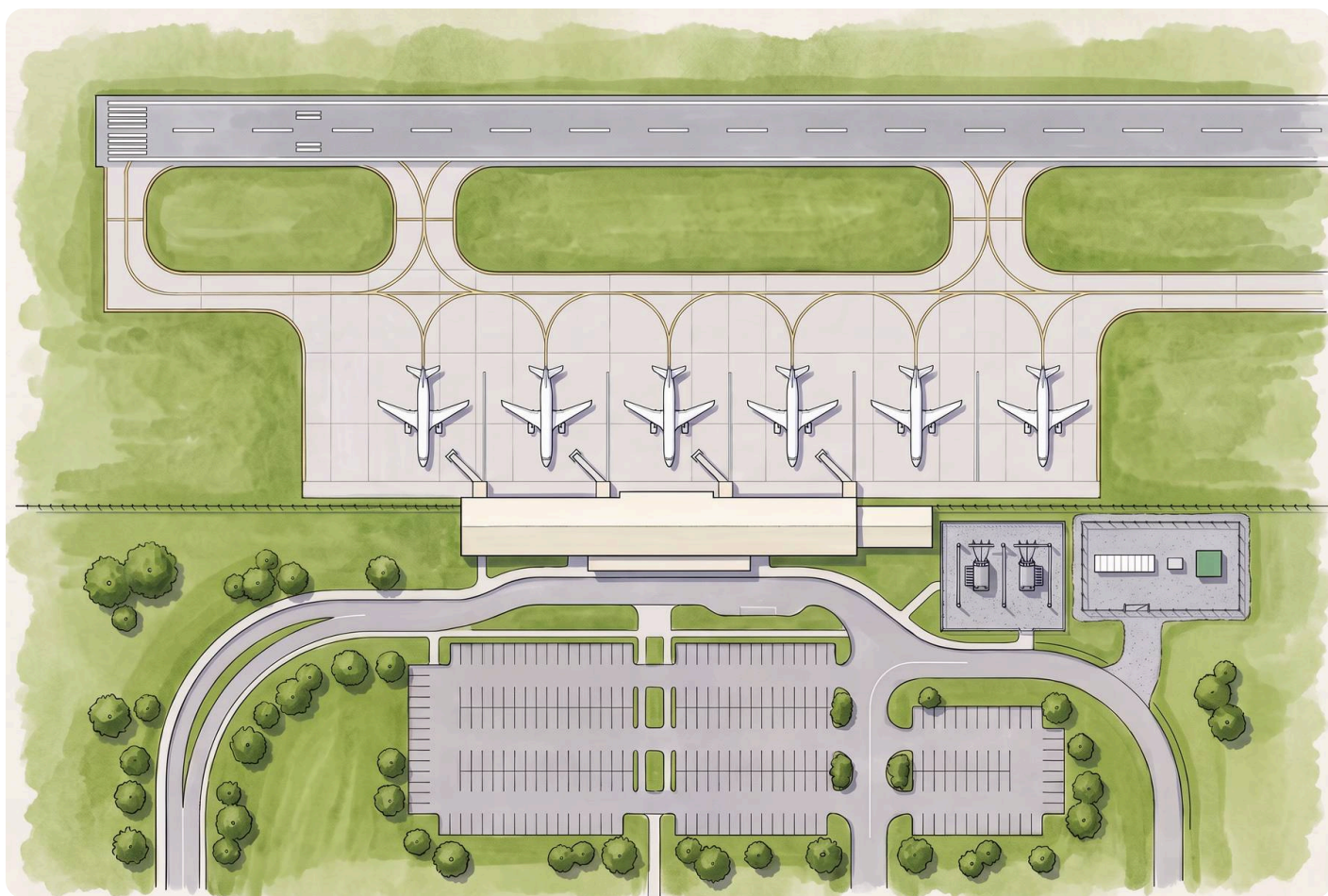


Figure 26. At an airport, the battery yard sits landside, away from the airfield, next to the terminal's own substation. Illustration, Gaiergy.

Airport projects and how they were paid for

 Redwood Coast, California (ACV) Public energy authority owns; installed 2021 2.3 MW / 8.9 MWh (RCEA, RCAM page^[175]) - Redwood Coast Energy Authority owns the generation; PG&E owns the microgrid lines; the county owns the airport (RCEA, RCAM page^[175]) - Upfront cost over \$11.6 million; \$5 million state grant (CEC-500-2026-006^[156]; RCEA, RCAM page^[175]) and a \$6.6 million USDA Rural Utilities Service loan (CEC-500-2026-006^[156]) (RCEA page: \$6.5 million (RCEA, RCAM page^[175])) - O&M \$145,000 a year (CEC-500-2026-006^[156])	 Chattanooga, Tennessee (CHA) Split ownership; commissioned 2018 560 kW / 510 kWh (EPB slide, DOE 2024^[176]) - Airport owns the solar, funded through an FAA VALE grant (Chattanooga Airport^[177]) - EPB, the city's utility, owns two 280 kW / 255 kWh battery units (EPB slide, DOE 2024^[176])	 Fresno Yosemite, California (FAT) Developer owns; construction deadline September 3, 2027 2,000 kW / 3,828 kWh (Fresno Council ID 26-566^[24]) - Two energy services agreements, one for storage; developer designs, finances, builds, operates and maintains (Fresno Council ID 26-566^[24]) \$0.2107/kWh fixed for 20 years; savings expected over \$10.5 million (Fresno Council ID 26-566^[24]) - Cost risks named: PG&E upgrades, a fire hydrant at the battery site, property tax status (Fresno Council ID 26-566^[24])
 Columbia, South Carolina (CAE) Airport project; construction 2026 to 2027 \$28 million total PRESS ONLY - Battery yard next to the terminal; utility spend cut by an estimated average 55% a year (CAE 2026^[178]) - Total cost \$28 million, part-funded by FAA grants, passenger facility charges, state grants and tax credits PRESS ONLY (WIS 2026^[179]) - Battery size and airport ownership: press and vendor statements only UNCONFIRMED	 JFK Lot 9, New York Developer owns, with NYPA; under construction 7.5 MW battery (NYPA 2024, JFK^[180]) - Developer pays the full upfront cost of about \$56 million (2020 estimate); no upfront cost to the Port Authority (PANYNJ 2020^[181]) - Battery used to cut airport energy use at peak times (NYPA 2024, JFK^[180])	 San Diego International (SAN) Announced 2019 2 MW / 4 MWh VENDOR (Cleantech San Diego 2019^[49]) - Paired with 5.5 MW of airport solar to cut peak demand charges VENDOR (Cleantech San Diego 2019^[49]) - Owner and payment form: UNCONFIRMED

Large airport ESPCs have not included batteries in the cases found. Hawaii's airports ESPC, about \$206 million, promised more than \$606 million in guaranteed savings over 20 years from lighting, solar and cooling, with no battery listed (Hawaii DOT 2018^[182]).

The tax credit gates

THE ANSWER

A city, county, state, school district, public authority or tax-exempt nonprofit that owns its battery can take the federal storage credit as a cash payment. **A federal agency cannot**, except through an ESCO that owns the battery. For an owner that qualifies, three gates decide whether the credit is full, cut or zero: **domestic content, prohibited foreign entity content and tax-exempt bonds**.

The credit

- Storage qualifies under section 48E for “*any energy storage technology*” (26 USC 48E^[147]), with a nameplate capacity of at least 5 kWh (26 CFR 1.48E-2^[183]). Lithium-ion batteries are listed (26 CFR 1.48E-2^[183]).
- Rate: 6% base, or 30% if the project is under 1 MW or meets prevailing wage and apprenticeship rules (26 USC 48E^[147]).
- Bonuses: up to 10 points each for an energy community or domestic content at the 30% rate (26 USC 48E^[147]).
- Wind and solar placed in service after 2027 lose the credit. Storage does not (26 USC 48E^[147]). The storage phase-down starts with construction beginning in 2033: 100% in 2033, 75% in 2034, 50% in 2035, 0% from 2036 (26 USC 48E^[147]; 26 USC 45Y^[148]).

Who can take it as cash



City, county, school or authority owns

Direct pay

- States, political subdivisions and their agencies and instrumentalities are applicable entities (26 USC 6417^[36]; 26 CFR 1.6417-1^[184])
- Internal Revenue Service (IRS) examples include water districts and school districts (IRS elective pay FAQ^[145])
- Government-use bar switched off for the electing owner (26 USC 6417^[36]; 26 CFR 1.6417-2^[146])



Airport or port authority owns

Likely direct pay

- Fits as a state or local instrumentality **GAIERGY VIEW**
- Not named by the IRS for any specific authority **UNCONFIRMED**



Tax-exempt non-profit owns

Direct pay

- Applicable entities include “any organization exempt from the tax imposed by subtitle A” (26 USC 6417^[36])
- A Washington church received its direct payment in 2024, seven months after its battery and solar began operating (Clean Energy Group, Vashon UMC^[185])
- Qualified 501(c)(3) bonds can pay for a nonprofit-owned battery (26 USC 145^[186]), but tax-exempt bond money cuts the credit by up to 15% (Gate 3)



Federal agency owns

No credit

- Not an applicable entity; property used by the United States is barred (26 USC 6417^[36]; 26 USC 50^[187])
- FEMP points agencies to private ownership under an energy sales agreement to capture incentives (FEMP microgrid fact sheet 2025^[62])



ESCO owns and sells the output

Credit to the ESCO

- A contract to operate a storage facility is treated as a service contract, unless the government operates it, bears significant nonperformance risk, shares in operating-cost savings, or has an option to buy at a fixed price rather than fair market value (26 USC 7701^[188])
- A taxable owner that leases to a government, or to a tax-exempt nonprofit for its exempt use, is barred (26 USC 50^[187])

The owner rule is strict: the electing entity has to own the property, and credits owned by a third party do not qualify (26 CFR 1.6417-2^[146]). Pre-filing registration is a condition of the election (26 CFR 1.6417-5^[189]). An excessive payment is repaid with a 20% penalty unless there is reasonable cause (26 USC 6417^[36]). Whether a city qualifies when an ESCO or lender holds title on the placed-in-service date is **UNCONFIRMED**.

The three gates

GATE 1



Domestic content (direct pay only)

For a direct-pay owner, the share of credit paid without domestic content falls to **0%** for construction starting after 2025 (26 USC 45Y^[148]; IRS Notice 2024-9^[190]). Two ways out:

- Meet domestic content
- Maximum net output under 1 MW, as measured in AC (26 USC 45Y^[148])
- Or a Treasury cost or supply exception; attestation accepted for construction starting before the later of January 1, 2027 or further guidance (IRS Notice 2024-84^[191])

Miss it: zero credit. How the 1 MW AC test applies to a battery:

UNCONFIRMED

GATE 2



Prohibited foreign entity content

Storage that begins construction after 2025 is not eligible if it includes material assistance from a prohibited foreign entity (26 USC 48E^[147]). The test is a cost ratio. The share of cost free of prohibited foreign entities has to reach:

- 2026: 55%
- 2027: 60%
- 2028: 65%
- 2029: 70%
- After 2029: 75% (26 USC 7701^[188])

Miss it: zero credit. IRS interim safe harbors are in Notice 2026-15 (IRS Notice 2026-15^[192]). Whether the owner and recapture rules reach a government owner: **UNCONFIRMED**

GATE 3



Tax-exempt bond financing

The credit is cut by *"the lesser of 15 percent or a fraction"* tied to tax-exempt bond proceeds used for the project (26 USC 45^[193]; 26 USC 48E^[147]).

Miss it: up to 15% cut. Whether a municipal tax-exempt lease purchase used for an ESPC triggers the cut: **UNCONFIRMED**; bond counsel decides per deal

One entry test and three gates decide the credit

ENTRY CONDITION

Who owns the battery?

Direct pay goes only to the owner of the battery.

26 CFR 1.6417-2(c)(4)

QUALIFIES FOR DIRECT PAY

States, cities, counties, school districts and public authorities (agencies and instrumentalities, which can include an airport or port authority).

Tax-exempt nonprofits, tribal governments and rural electric co-ops.

26 U.S.C. 6417(d)(1)(A); 26 CFR 1.6417-1(c)

DOES NOT QUALIFY

Federal agency: no direct pay, and no credit for property the United States uses. Route: an ESCO owns the battery under an ESPC energy sales agreement and claims the credit.

A taxable ESCO that leases the battery to any government: blocked.

6417(d)(1); 50(b)(4); FEMP ESA FAQ and microgrid fact sheet (2025)

UNCONFIRMED: direct pay for any named airport or port authority (the IRS lists none); direct pay if the ESCO or lender holds title on the placed-in-service date.



Qualifies: go to the three gates

1 GATE 1 Construction starts 2026 or later: domestic content?

PASSES IF

Meets the domestic content test, or is under 1 MW (AC), or fits a Treasury exception (US content adds over 25% to cost, or is not available).

45Y(g)(12)(B) and (D), applied by 48E(d)(5)

IF NOT

Direct-pay credit is paid at 0% for construction that starts after Dec 31, 2025.

45Y(g)(12)(C); IRS Notice 2024-9

UNCONFIRMED

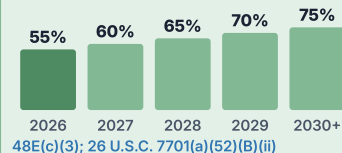
How the under 1 MW (AC) test applies to a battery.

Rules for construction from Jan 1, 2027 if no further guidance issues (Notice 2024-84 attestation window).

2 GATE 2 Prohibited foreign entity (PFE): material assistance

PASSES IF

The share of material cost from non-prohibited sources must meet the year's threshold:



IF NOT

Below the threshold: the battery is not "energy storage technology". Zero credit.

48E(c)(3); 7701(a)(52)

UNCONFIRMED

Whether the owner bar and 10-year recapture reach a direct-pay government.

Safe-harbor mechanics in IRS Notice 2026-15.

3 GATE 3 Paid for with tax-exempt bonds?

IF NO

No tax-exempt bond money: no cut.

IF YES

Credit cut by the lesser of 15% or the bond-financed share of the cost.

45(b)(3), applied by 48E(d)(2)

UNCONFIRMED

Whether a municipal tax-exempt lease-purchase used for an ESPC counts as a section 103 bond. Bond counsel decides per deal.

Through all three gates Up to 30% plus bonus points

30% if under 1 MW, or if prevailing wage and apprenticeship rules are met (otherwise 6%). Plus 10 points in an energy community and 10 points for domestic content. Register with the IRS before filing; a credit paid in error is repaid plus 20%.

26 U.S.C. 48E(a); 6417(d)(6); 26 CFR 1.6417-5

Sources: 26 U.S.C. 45, 45Y, 48E, 50, 6417, 7701 (Cornell LII, with Pub. L. 119-21 amendments); 26 CFR 1.6417-1, -2, -5 (eCFR); IRS Notices 2024-9, 2024-84, 2026-15; FEMP ESPC ESA FAQ and Financing Microgrids fact sheet (2025). All accessed 2026-10-02. UNCONFIRMED items are open questions in the law, not settled answers.

Figure 27. The path from a 30% credit to the cash payment, and the three gates that can close it.

Gaergy graphic based on 26 U.S.C. 48E, 45Y, 45 and 7701 (26 USC 48E^[147]; 26 USC 45Y^[148]; 26 USC 45^[193]; 26 USC 7701^[188]).

San Diego's energy and water savings contract, financed by a tax-exempt lease of nearly \$112 million and approved in early 2026, includes nearly 4 MWh of batteries. The city says the financing *"considered the elimination of anticipated Investment Tax Credits (ITC) for battery energy storage systems based on new federal program deadlines established in summer 2025, which also informed the removal of several sites"* (City of San Diego EWSPC^[14]). The expected loss of the credit helped shape the scope.

Operations and maintenance: the half that decides the outcome

THE ANSWER

The contract pays for the battery. **O&M decides whether it pays back and whether it stays safe.** Most failures with a known cause came from how batteries were built, commissioned and run. Most lost savings come from a battery that is offline, empty or out of control at the wrong 15 minutes. Both are O&M problems, and both can be bought, priced and enforced in the contract.

65%

of classified root causes: integration and construction (36%) plus operation (29%) (EPRI 2024 root cause paper^[2])

72%

of known-age failures: build to year two (EPRI 2024 root cause paper^[2])

4%

of sampled California nonresidential batteries discharged 0 kWh in 2024, mostly 2012 to 2016 systems (SGIP 2024 evaluation^[9])

2.5 to 4%

of capital cost per year: National Renewable Energy Laboratory (NREL) O&M estimate, capacity top-up included (NREL ATB 2024^[194]; NREL ATB 2025^[195])

10.1 What the failure record says

The Electric Power Research Institute (EPRI) keeps a public database of battery fires and failures with a public safety impact. On 2026-10-02 it listed 165 incidents at utility-scale and commercial stationary systems worldwide, 44 of them in the United States (Gaiergy count of the database file) (EPRI database CSV^[196]). The fleet is getting much safer. EPRI's chart shows failure incidents per GWh deployed falling about 99% from 2018 to 2025 (EPRI failure rate chart 2026^[3]). EPRI's 2024 paper gave a 97% drop for 2018 to 2023 (EPRI 2024 root cause paper^[2]).

EPRI, TWAICE and PNNL studied the 26 incidents with enough detail to assign a cause (EPRI 2024 root cause paper^[2]). Their findings point straight at O&M **GAIERGY VIEW** :



Root cause

- Integration, assembly and construction: 36%
- Operation: 29%
- Design: 21%
- Manufacturing: 14% (EPRI 2024 root cause paper^[2])

Integration failures include *"inadequate commissioning procedures"*. Operation includes wrong sensing of voltage, current or temperature (EPRI 2024 root cause paper^[2])



What failed

- Controls: 46%
- Balance of system (cooling, wiring, suppression): 43%
- Cells or modules: 11% (EPRI 2024 root cause paper^[2])

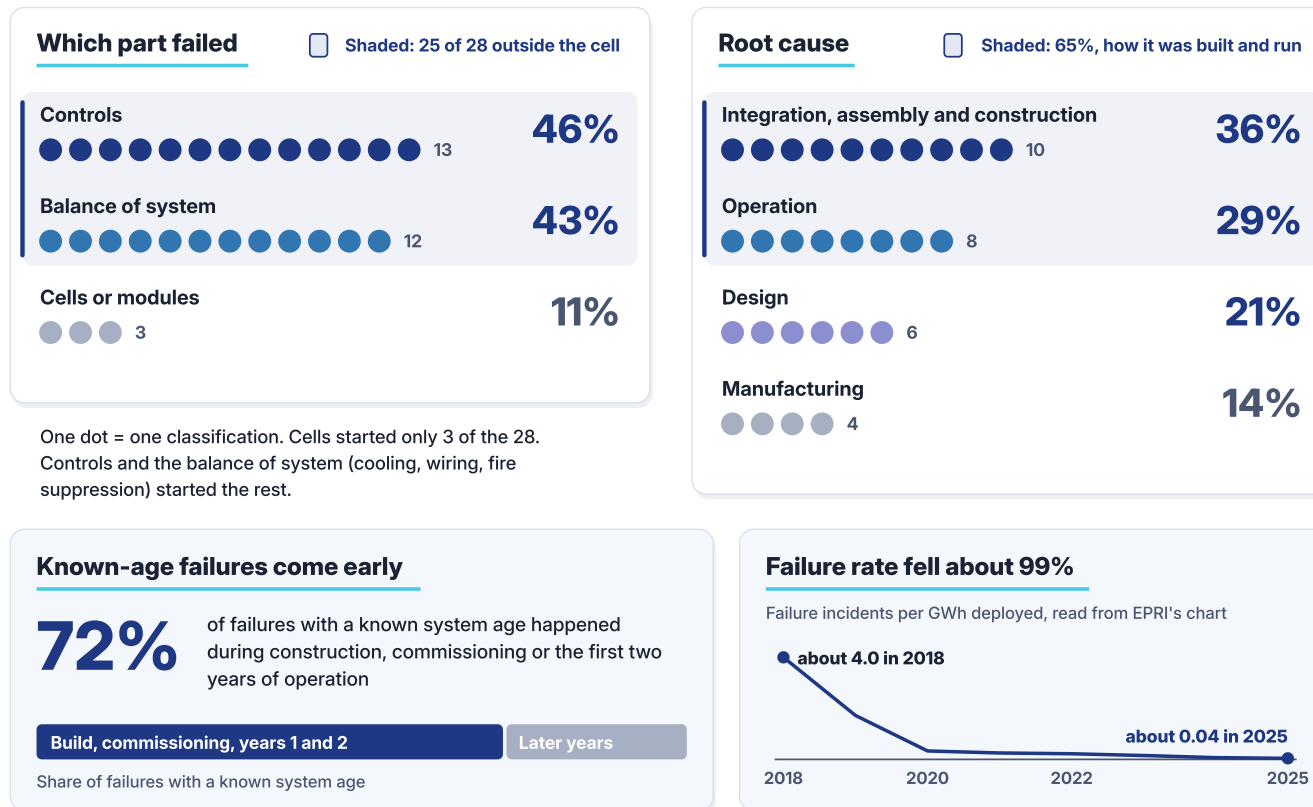
EPRI: *"the data challenges the widespread assumption that the lithium ion battery cell is the primary cause of failure"*. EPRI adds that many controls failures were about limiting cell state of charge, voltage and current *"due to cell limitations"* (EPRI 2024 root cause paper^[2])

Two of EPRI's recommended fixes are O&M work: *"Workforce training and quality checks during energy storage commissioning and installation"*, and *"Battery monitoring and analytics to augment BMS operation"* (EPRI 2024 root cause paper^[2]). EPRI also found that *"No current federal, state, or local jurisdiction requires incident reporting"* as of 2024 (EPRI 2024 root cause paper^[2]). EPRI also lists codes compliance, hazard assessments and supplier quality checks (EPRI 2024 root cause paper^[2]). EPRI's *"operation"* category means charge, discharge and rest behavior beyond the design limits of the equipment (EPRI 2024 root cause paper^[2]).

167-C^[45]).

Most battery failures start outside the cell

The 26 failures that EPRI, TWAICE and PNNL could classify, by the part that failed and by the root cause



Sources: EPRI with TWAICE and PNNL, "Insights from EPRI's BESS Failure Incident Database: Analysis of Failure Root Cause," May 2024, product 3002030360, Figure 4 (root cause), Figure 6 (failed element) and p. 8 (72% of failures with a known system age). Counts as published: each chart has 28 classifications from 26 incidents. EPRI, "Global Grid-Scale Storage Deployment and Failures" chart, data as of Q1 2026, EPRI BESS Failure Incident Database page, energystorage.epri.com. Both accessed Oct. 2, 2026. Line values are Gaierav readings of EPRI's chart and are approximate.

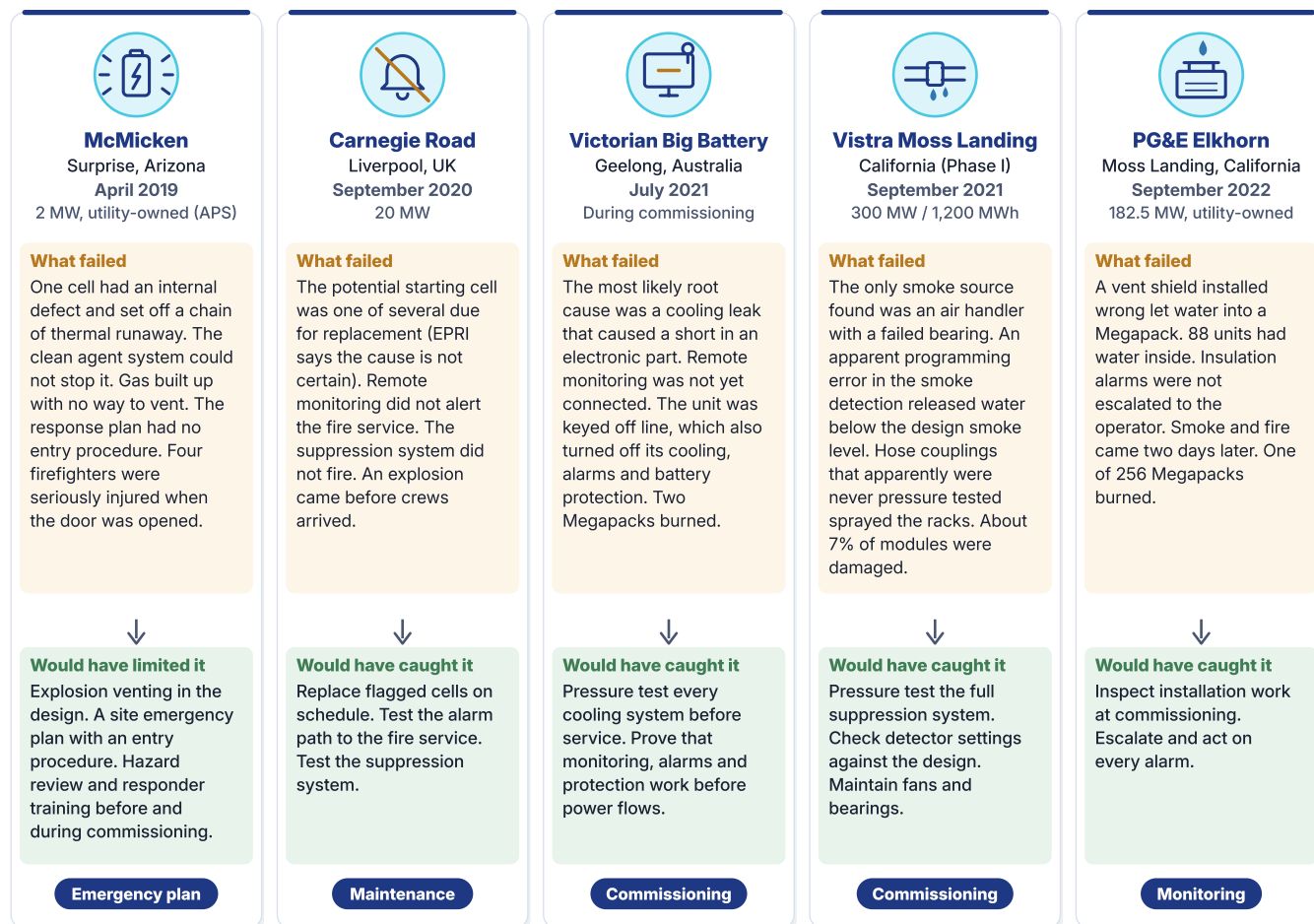
Figure 28. Where battery failures start. Two thirds of classified root causes are in how systems are built and run; nine in ten failed elements are not the cells. Gaiergy graphic of EPRI data (EPRI 2024 root cause paper^[2]; EPRI failure rate chart 2026^[3]).

10.2 Five incidents, five O&M lessons

These five incidents have published technical findings. In each one, a commissioning, monitoring, maintenance or emergency-planning step was missing **GAIERGY VIEW**.

Five fires, five lessons: each traces to a step that O&M or commissioning controls

What the investigation found, and the step that would have caught it or limited the harm. Oldest first.



No owner or state investigation report found, so not shown above:

Visita Moss Landing fire, January 2025. Gateway, Otay Mesa (San Diego), May 2024. East Hampton, New York, 2023 (no cause published). Warwick and Chaumont, New York, 2023: EPRI's database classifies Warwick as design plus integration and Chaumont as design (controls), but no owner or state investigation report has been published.

Sources (accessed Oct. 2, 2026): DNV GL, *McMicken BESS Event: Technical Analysis and Recommendations*, for APS, July 18, 2020, pp. 1 to 2; UL FSRI report page, July 29, 2020. Merseyside Fire and Rescue Service, *Significant Incident Report 018965*, p. 3, 26; EPRI, *Carnegie Road Lessons Learned*, April 2023, 3002026396, p. 4, 8. Energy Safe Victoria, *Statement of Technical Findings: Fire at the Victorian Big Battery*, pp. 1 to 2; *Visra, Findings and Corrective Actions*, Sept. 4, 2021 Incident, Jan. 21, 2022, pp. 1 to 2. PG&E Currents, *Moss Landing Megapack incident findings* (archived Jan. 25, 2024); EPRI, 3002030360, May 2024, p. 5. *Vistra* size: EPRI BESS Failure Incident Database (stationary table). Gray strip: EPA site records; *Vistra* Form 10-Q, June 30, 2026; EPRI Storage Wiki event pages for East Hampton (May 31, 2023), Warwick (June 27, 2023) and Chaumont (July 27, 2023); EPRI, 3002030360.

Figure 29. Five incidents with published findings: what failed, and the O&M step that would have stopped it. Gaiergy graphic based on the reports cited in the cards below.

McMicken, Arizona, 2019



Utility-owned, 2 MW / 2 MWh, 25 months in service

WHAT FAILED

One cell's internal defect started a cascade. The clean-agent system worked as designed but cannot stop thermal runaway. Gas built up with no way to vent. The emergency plan had no entry procedure. Firefighters opened the door about three hours in (DNV GL 2020, McMicken^[197]).

O&M STEP

Explosion control, a site emergency plan with an entry procedure, and responder training before commissioning (DNV GL 2020, McMicken^[197]).

Cost: four career firefighters severely injured (UL FSRI 2020^[198])

Liverpool, United Kingdom, 2020



20 MW, remotely managed

WHAT FAILED

Remote management did not alert the fire service. The suppression system "failed to actuate". The potential starting cell was one of several "due for replacement" (Merseyside FRS 2020^[199]). Root cause not confirmed after 11 months (EPRI 2023, Carnegie Road^[200]).

O&M STEP

Alarm paths to the fire service tested, suppression tested, and flagged parts replaced on time (Merseyside FRS 2020^[199]).

Cost: explosion before crews arrived; debris thrown 6 to 22 meters (20 to 72 feet) (Merseyside FRS 2020^[199])

Victorian Big Battery, Australia, 2021



Fire during commissioning

WHAT FAILED

The most likely root cause was a cooling leak that caused a short (Energy Safe Victoria^[201]). Monitoring took 24 hours to map, and offline mode shut down telemetry, cooling and the protection system (Energy Safe Victoria^[201]).

O&M STEP

Monitoring live and verified before any power flows; cooling pressure tested (Energy Safe Victoria^[201]).

Regulator: the fault "would likely have been identified and either manually or automatically contained" (Energy Safe Victoria^[201])

 Fires with no published cause Stated as found on 2026-10-02 Moss Landing, January 2025: about 1,200 people evacuated (US EPA 2025, Moss Landing^[202]); Vistra says it is still investigating the cause (Vistra 10-Q Q2 2026^[203]) Gateway, San Diego, May 2024: flare-ups until May 28; US Environmental Protection Agency (EPA): <i>"The root cause of the fire remains under investigation"</i> (US EPA, Gateway site profile^[204]) New York, 2023: East Hampton (no cause published), Warwick and Chaumont. EPRI's database classifies Warwick as design plus integration and Chaumont as design (controls); no owner or state root cause report was found (EPRI Storage Wiki, East Hampton^[205]; EPRI Storage Wiki, Warwick^[206]; EPRI Storage Wiki, Chaumont^[207]; NY FSWG data findings 2023^[208]) No published root cause. This report does not guess at one	 Vistra, Moss Landing, 2021 300 MW / 1,200 MWh in a building (EPRI database CSV^[196]) WHAT FAILED The only smoke source found was an air handler with a failed bearing. An apparent programming error in the smoke detection released water below the design smoke level. Hose couplings that were apparently never pressure tested sprayed the racks (Vistra 2022 findings^[209]). O&M STEP End-to-end pressure test at commissioning, detector settings checked against design, and fan maintenance (Vistra 2022 findings^[209]). Cost: about 7% of modules damaged; no injuries (Vistra 2022 findings^[209])	 Elkhorn, Moss Landing, 2022 Utility-owned, 182.5 MW / 730 MWh WHAT FAILED An improperly installed vent shield let water in. 88 units had water intrusion (PG&E Currents, Elkhorn^[210]). Insulation alarms <i>"were not properly escalated to the operator"</i>; fire came two days later (EPRI 2024 root cause paper^[2]). O&M STEP Installation inspection, and alarm escalation with a named responder for every alarm class (PG&E Currents, Elkhorn^[210]; EPRI 2024 root cause paper^[2]). Cost: one unit burned; restart about three months later; no injuries (PG&E Currents, Elkhorn^[210])
---	---	---

The cost of a large failure runs far past the battery. At Moss Landing, Vistra wrote off about \$400 million for the 300 MW building and took a \$155 million impairment on the 100 MW facility; it does not plan to return either to service (Vistra 10-Q Q2 2026^[203]). As of September 2025, about 45% of the batteries were still in the building, charged, and removal was expected to end in the final months of 2026 (US EPA 2025, Moss Landing^[202]).

10.3 How poor O&M loses money



One missed peak

The month's billed demand is the single highest interval, usually 15 minutes (NREL/BR-6A20-68963^[10]). In NREL's study, the lowest-payback batteries cut the peak by about 2.5%, and that cut lasted *"generally one interval: 15 minutes"* (NREL/TP-5400-63162^[211]).

If the battery is offline, empty or out of control in that one interval, most of that month's demand savings are lost. With a 12-month ratchet, one miss can raise billed demand for up to a year. Ratchet length varies by tariff

GAIERGY VIEW



Idle and weak batteries

- 2020: average capacity factor 6%; nonresidential systems from 0% (not performing) to 25% (SGIP 2020 evaluation^[212]). A low capacity factor is normal for peak shaving; 0% means not working
GAIERGY VIEW
- 2024: 40 nonresidential projects (4%) discharged 0 kWh; most applied in 2012 to 2016 and reflect one developer's later decommissioning (SGIP 2024 evaluation^[9]); round-trip efficiency 71% to 73% for older systems against 86% for newer ones (SGIP 2024 evaluation^[9])

California's Self-Generation Incentive Program evaluations



Program penalties

- New York Independent System Operator (NYISO): a shortfall in a demand response resource draws a deficiency charge of 1.5 times the market clearing price (NYISO ICAP Manual v19.0^[213])
- NYISO also lowers future sellable capacity after poor test or event performance (NYISO ICAP Manual v19.0^[213])
- PJM charges for each MW short during an emergency interval (PJM Manual 18 Rev. 63^[214])

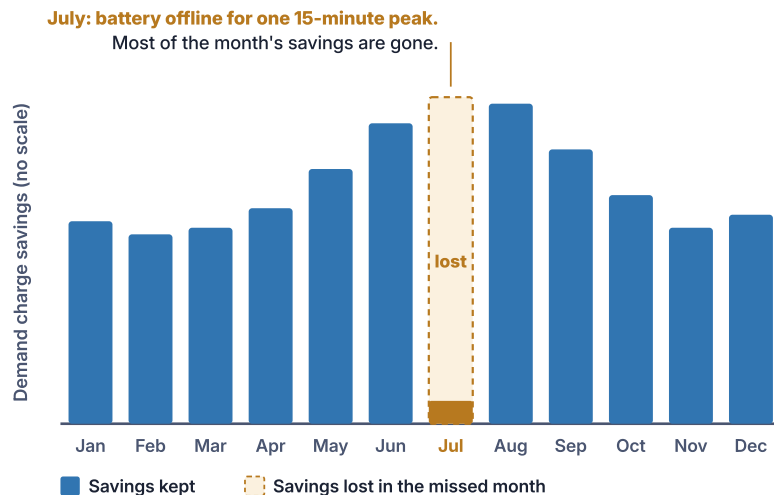
A PUBLIC EXAMPLE

At the Redwood Coast Airport microgrid, the final report estimates a fully working system would earn \$150,000 to \$200,000 a year from energy and grid services. Actual income was \$80,000 to \$128,000 a year in 2022 to 2024 because the DC converters between the solar array and the batteries kept failing. After their replacement in May 2025, income was expected near \$160,000 (CEC-500-2026-006^[156]).

One missed peak can wipe out most of a month's demand savings

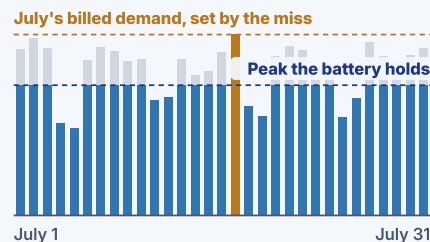
Demand charge savings by month for a building with a battery. In July the battery misses one 15-minute peak.

ILLUSTRATIVE



Inside July: the meter's 15-minute readings

Highest 15-minute reading each day. Gray: without the battery. Blue: what the meter sees.



Fact (NREL)

Demand charges are typically based on the highest average use in a set interval, usually 15 minutes, in the billing period. So one interval sets the month's billed demand.

Gaiergy inference

If the battery is offline, empty or out of control in that one interval, most of that month's demand savings are lost. Under an annual ratchet, one miss can raise billed demand for up to 12 months. Check each tariff.

ILLUSTRATIVE: bar heights and daily readings are drawn examples, not a real building or tariff. Fact source: McLaren and Mullendore, Identifying Potential Markets for Behind-the-Meter Battery Energy Storage: A Survey of U.S. Demand Charges, NREL/BR-6A20-68963, 2017, p. 2. Ratchet: Neubauer and Simpson, NREL/TP-5400-63162, 2015, pp. 14, 25. Both docs.nrl.gov, accessed Oct. 2, 2026. The lost-savings and ratchet consequences are Gaiergy inference from these definitions.

Figure 30. One missed peak loses the month. Illustration with made-up numbers, not data from a real site. Gaiergy graphic based on the demand charge definition in NREL (NREL/BR-6A20-68963^[10]).

10.4 Batteries fade, so plan to top them up

A battery holds less energy every year. The contract term can be longer than the battery's own life.



How fast

- Lazard models 2.6% a year for utility and commercial batteries, with a 10% oversize in year one (Lazard LCOE+ 2025^[215])
- PNNL: lithium iron phosphate falls below 80% of rated energy after about 2,400 cycles at 80% depth of discharge (PNNL-33283^[216])



How long

- FEMP expected service life: 10 years (FEMP BESS procurement checklist 2023^[43])
- NREL picks 15 years as a conservative life because existing 4-hour batteries are new and *"no system has yet reached 15 or more years"* (NREL/TP-6A40-93281^[217])
- NREL field warning: real life is *"often about half"* of the maker's figure (2018 guide covering all battery types; blamed on overheating and, in many solar applications, long periods at low charge) (NREL/TP-7A40-73822^[218])



What the warranty covers

- FEMP template: at least 70% of nominal energy for 10 years or a set throughput (FEMP Li-ion BESS spec 2025^[42])
- One maker's small-battery warranty: 70% at 10 years, about 3 points a year **ESTIMATE** (Tesla Powerwall warranty^[219])
- No public large-battery warranty document was found; one maker's maintenance agreement is itself confidential (Tesla Megapack Maintenance Agreement^[220]), so warranty terms likely sit in confidential supply contracts

GAIERGY VIEW



How to keep capacity

- Augmentation: add batteries over time to *"compensate for partially lost capacity"*, either above a threshold or a fixed number of times (Fluence 10-K FY2024^[221])
- PNNL adds capacity each time usable energy reaches 60% of rated, to reach a 20 to 25 year life (PNNL-33283^[216])
- One vendor offers capacity guarantees *"up to 25 years"* **VENDOR** (Fluence Smart Service Plans^[222])

The DOE IDIQ contract allows a reserve account for an identified future expense of a measure, and reserve funds *"shall not be used to offset any guaranteed savings shortfall"* (DOE IDIQ ESPC contract 2023^[75]). A battery

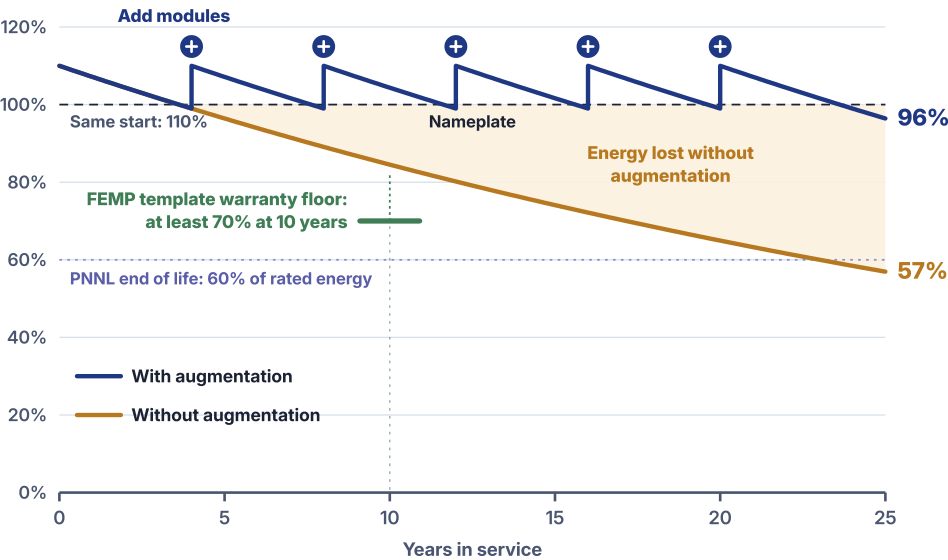
augmentation reserve fits that clause **GAIERGY VIEW**; no federal statement says so for batteries

UNCONFIRMED

Without augmentation, a battery loses about half its energy in 25 years

Same battery, sized 10% over nameplate. Usable energy as a share of nameplate, with and without added modules.

ILLUSTRATIVE



What the lines assume

2.6% a year
Lazard's fade rate for utility and commercial batteries.

110% in year one
Lazard sizes the battery 10% over nameplate, then augments to nameplate.

Augmentation is O&M
NREL counts it inside yearly O&M: 2.5% (2024) to 4% (2025) of capital cost.

Every 4 years
Gaiergy example timing for the steps, not a schedule.

ILLUSTRATIVE, not a forecast. Fade compounds at 2.6% of the prior year's energy. Sources (accessed Oct. 2, 2026): Lazard, Levelized Cost of Energy+ (June 2025), LCOS v10.0, PDF pp. 42, 47 (2.6% a year, 110% year-one overbuild, augmentation to nameplate). DOE FEMP, Lithium-Ion BESS Technical Specifications (2025 template), Battery Warranties (70% at 10 years or a throughput limit, whichever comes first). PNNL-33283 (2022), p. 43 (60% end of life). NREL ATB 2024 and 2025, battery storage pages, atb.nrl.gov (O&M 2.5% to 4%).

Figure 31. Capacity over 25 years, with and without augmentation. Fade rate from Lazard; warranty floor from the FEMP template; augmentation trigger from PNNL (Lazard LCOE+ 2025^[215]; FEMP Li-ion BESS spec 2025^[42]; PNNL-33283^[216]).

10.5 What O&M costs

Published O&M costs vary because they include different things. Use the range, and ask each bidder what its number covers.

2.5%

of capital cost per year, NREL 2024, capacity top-up included, 15-year life (NREL ATB 2024^[194])

4%

of capital cost per year, NREL 2025, raised after a detailed augmentation study (NREL ATB 2025^[195]; NREL/TP-6A40-93281^[217])

\$7.3 to \$9.1

per kWh a year, commercial 1 MW / 2 MWh battery, Lazard 2025, plus warranty from year 3 (Lazard LCOE+ 2025^[215])

\$145,000

a year, O&M for the whole Redwood Coast Airport microgrid: 2.2 MW of solar plus a 2.3 MW / 8.87 MWh battery (CEC-500-2026-006^[156])

- NREL: lower published O&M values “typically include only simple maintenance”, while higher ones include capacity additions for degradation (NREL/TP-6A40-85332^[223]). At NREL's 2025 battery cost, 4% is about \$53 per kW a year (2024 dollars, 4-hour utility-scale) **ESTIMATE** (NREL/TP-6A40-93281^[217]).
- PNNL's \$4.59 per kW a year for a 10 MW, 4-hour system covers yearly minor maintenance plus a power equipment refurbishment every 10 years; battery capacity additions are costed separately (PNNL-33283^[216]).
- Lazard adds an extended warranty of 0.50% to 1.30% of capital cost a year from year 3 for commercial batteries (Lazard LCOE+ 2025^[215]).
- One maker's large-battery maintenance agreement runs 15 years with a 2% yearly price rise and caps each party's liability in any year at that year's price (Tesla Megapack Maintenance Agreement^[220]).

These figures are not like for like: NREL's includes augmentation, PNNL's excludes it, and Lazard adds augmentation and warranty on top of its O&M line (NREL ATB 2024^[194]; PNNL-33283^[216]; Lazard LCOE+ 2025^[215]).

10.6 What the work is



Every day

- Performance monitoring and alarm management (NREL/TP-7A40-73822^[218])
- 15-minute data, temperature and state of charge; preventive maintenance alerts (FEMP Li-ion BESS spec 2025^[42])
- New York's working group recommended a 24/7 staffed operations center (Section 10.7)



Every quarter and year

- Quarterly: ventilation and filters (NREL/TP-7A40-73822^[218])
- Yearly: visual survey for bulging cases, corrosion check, re-torque connections, grounding check (NREL/TP-7A40-73822^[218])
- Yearly for one large-battery product: calibration, harness, gasket, cooling and communications checks (Tesla Megapack Maintenance Agreement^[220])



Every 10 years

- Coolant refill, fan, pump and door gasket replacement for one large-battery product (Tesla Megapack Maintenance Agreement^[220])
- PNNL: refurbish power equipment at 30% of its cost every 10 years (PNNL-33283^[216])



When things change

- Update dispatch when tariffs or loads change (FEMP Li-ion BESS spec 2025^[42])
- Keep firmware current for cybersecurity (FEMP Li-ion BESS spec 2025^[42])
- Annual report with outages and root causes, repairs and safety incidents (FEMP Li-ion BESS spec 2025^[42])



Warranty traps

- Work not done to the maker's manuals, or by uncertified people, can void a warranty (Tesla Powerwall warranty^[219])
- One small-battery warranty can drop toward four years if the unit is offline from the internet too long (Tesla Powerwall warranty^[219])
- Temperatures outside specification can reduce or void claims (NREL/TP-7A40-73822^[218])



Cybersecurity

- DOE treats distributed resources from 1 kW to 10,000 kW, including batteries, as an emerging cyber concern (DOE CESER and EERE 2022^[224])
- FEMP asks for a battery internet connection separate from the agency network (FEMP Li-ion BESS spec 2025^[42])



Spares and response

- California's rule for large systems: spare parts on hand, because they "*avoid unnecessary downtime*" (CPUC GO 167-C^[45])
- FEMP template: 3-day contractor response during the 1-year turnkey warranty, plus agency-set availability, outage hours and penalties (FEMP Li-ion BESS spec 2025^[42])

10.7 Fire code proposals are moving O&M into law

After three battery fires in 2023, New York formed an Inter-Agency Fire Safety Working Group on July 28, 2023 (NYSERDA FSWG page^[225]). It inspected 57 larger operating projects (NYSERDA FSWG page^[225]). Many of its recommendations are O&M rules (NY FSWG recommendations 2024^[226]) **GAIERGY VIEW**. The final 2025 Fire Code wording for each item below is **UNCONFIRMED**; the sources are the recommendations and the 2024 draft:



24/7 monitoring

Battery data at the cell or cell-group level “monitored by a 24/7 staffed Network Operations Center”, with critical alarms sent at once to the owner and O&M company (NY FSWG recommendations 2024^[226]).



A responder on call

A qualified person available for dispatch within 15 minutes and on scene within 4 hours (2024 draft) (NYSERDA 2024 release^[227]).



Inspections and review

Periodic third-party special inspections, and independent peer review above 600 kWh, paid by industry (NY FSWG recommendations 2024^[226]).



Plans and training

A site emergency response plan and annual fire department training (NY FSWG recommendations 2024^[226]).

New York adopted updated codes based on these recommendations on July 25, 2025. The 2025 Fire Code of New York State took effect December 31, 2025 (NYSERDA FSWG page^[225]). Which code section carries each recommendation, including 24/7 monitoring, is **UNCONFIRMED**. The older code already required an O&M manual on site, a contracted service agency, a service log, and qualified people for repairs (NYSERDA BESS Guidebook 2024^[41]). After a fire, the owner pays for a continuous fire watch until damaged equipment is removed, if the fire official asks (NYSERDA BESS Guidebook 2024^[41]).

California's new General Order 167-C sets maintenance and operation standards for storage, including spare parts, equipment history, annual procedure review, routine inspections with trend analysis and emergency plans shared with local responders (CPUC GO 167-C^[45]). But facilities of 1 to 50 MW only have to follow prudent practices, not the detailed maintenance standards; systems under 1 MW are exempt; and the law exempts facilities of municipal utilities, water and wastewater agencies, and a city and county operating as a public utility (CPUC GO 167-C^[45]; Cal. Pub. Util. Code 761.3^[228]). So for most public batteries, O&M quality depends on the contract **GAIERGY VIEW**. The Texas State Fire Marshal notes that NFPA 855 calls for regular inspections,

functional tests, maintenance records and an emergency plan with annual staff training (Texas State Fire Marshal 2025^[229]).

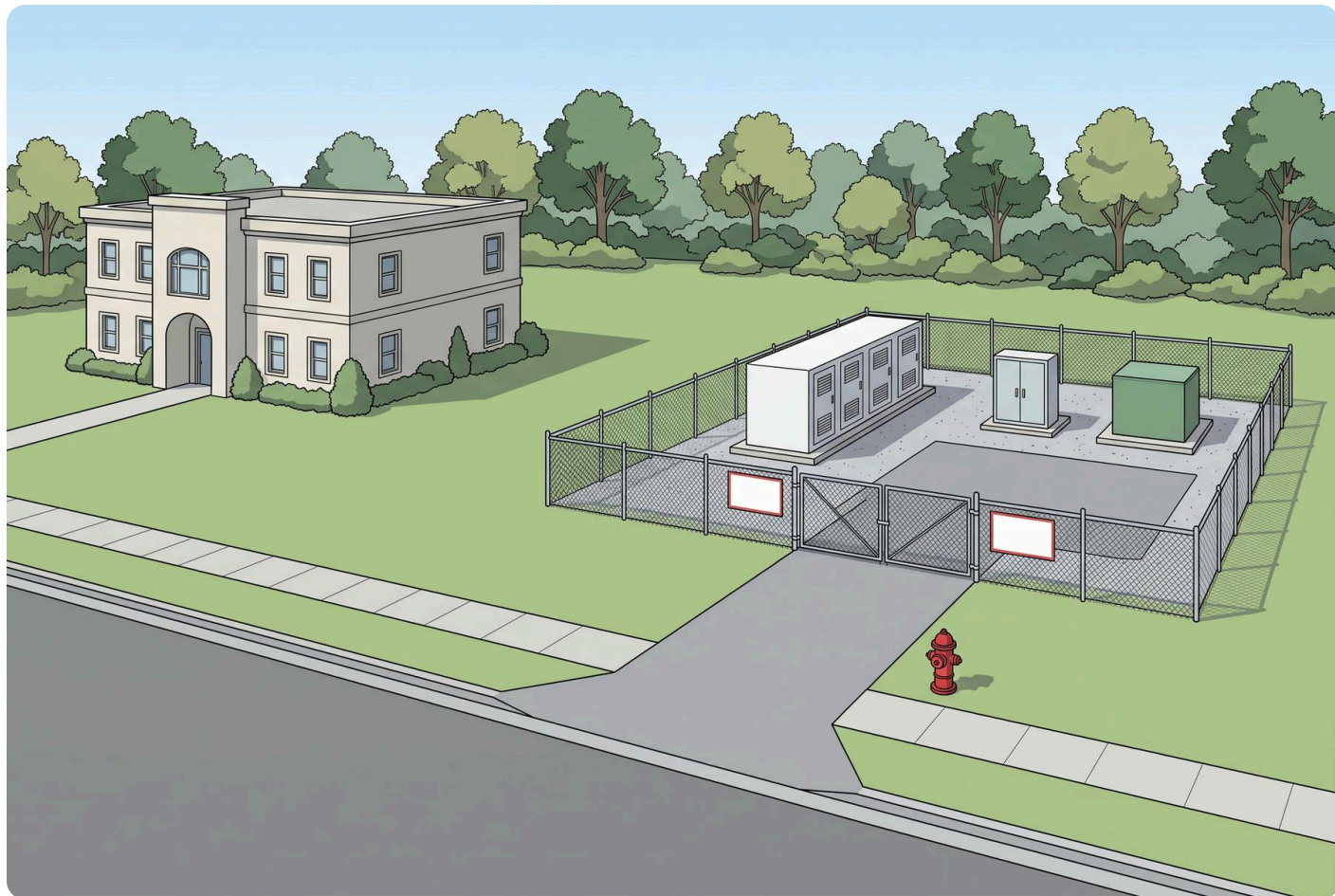


Figure 32. A battery yard planned for the fire department: clear lane, hydrant, signage and gate. Illustration, Gaiergy.

10.8 Who does what under each contract

Each path puts the O&M duty somewhere different. The danger is a gap: a term with nobody named.



Two federal guidance lines frame the choice. FEMP: *"The site should not accept responsibility for any operations and maintenance tasks it is not prepared to fulfill"*, and in an ESPC *"it may be allowable to*

include long-term operations and maintenance in the initial contract award” (FEMP BESS procurement checklist 2023^[43]). FEMP also warns that battery makers “may require O&M support for the life of the asset to maintain their warranty”, and asks for a bid for O&M for the full project life (FEMP Li-ion BESS spec 2025^[42]). In the public market today, only 28% of ESCOs say they typically deliver full-term M&V (LBNL ESCO report 2026^[109]).

Who does the O&M: state and local paths

Six duties that keep a battery safe and earning. Federal paths are in the next figure.



Gaiergy illustration. Green tags: Gaiergy's reading of who usually holds the duty; the contract decides. Sources (accessed Oct. 2 and 3, 2026): NY Inter-Agency Fire Safety Working Group, Fire Code Recommendations (July 2024) and NYSERDA working group page; 2020 Fire Code of NYS Sec. 1206.9 and NYSERDA Model Law Sec. G and H (NYSERDA Guidebook, Nov. 2024); FEMP Li-ion BESS Technical Specifications (2025) and Procurement Checklist (2023); FEMP M&V Guidelines 5.0 (2024); state ESPC laws, incl. N.J.S.A. 40A:11-4.6 third-party verification; CPUC GO 167-C OS 20; Xcel MN tariff A43; Georgia Power DER FAQ; MMWEC releases.

Figure 33. Who does each O&M duty on state and local contract paths; federal paths are in the next figure. Gaiergy graphic based on the sources in the cards above.



Who does the O&M: federal paths

The same six duties for federal agencies. State and local paths are in the previous figure.

- Public owner
- ESCO, developer or contractor
- Utility or its ratepayers
- Set by the contract
- Fire department

	Federal ESPC 42 U.S.C. 8287	Federal UESC 42 U.S.C. 8256(c)	Federal ESA ESCO-owned energy sales agreement
	Up to 25 yrs	25 yrs (GSA)	Up to 25 yrs
24/7 monitoring NY Fire Safety Working Group recommendation (July 2024): a staffed 24/7 operations center. Final code wording UNCONFIRMED.	 ESCO Gaiergy reading	 If in the contract	 ESCO Gaiergy reading
Preventive maintenance Code: an O&M manual and a contracted service agency on file (NY Fire Code 1206.9).	 ESCO, by law	 If in the contract	 ESCO to end of term
Augmentation (adding batteries as capacity fades) FEMP: put augmentation in the RFP.	 Write it in	 Write it in	 Write it in
Measurement and verification FEMP M&V 5.0: Option B, measured for the life of the measure.	 Annual audit and M&V, by law	 Assurance plan	 Guarantee; metered
Emergency plan and responder training Owner writes the plan; the fire department is trained on it, yearly in New York.	 Agency and fire department	 Owner and fire department	 ESCO and fire department
Decommissioning Notify the fire official first; NY model law: fund or bond for the life.	 Agency, the owner at the end	 Owner at the end	 Agency, after it takes title

Gaiergy illustration. Green tags: Gaiergy's reading of who usually holds the duty; the contract decides. Sources (accessed Oct. 2 and 3, 2026): NY Inter-Agency Fire Safety Working Group, Fire Code Recommendations (July 2024) and NYSERDA working group page; 2020 Fire Code of NYS Sec. 1206.9 and NYSERDA Model Law Sec. G and H (NYSERDA Guidebook, Nov. 2024); FEMP Li-ion BESS Technical Specifications (2025) and Procurement Checklist (2023); FEMP M&V Guidelines 5.0 (2024); 42 U.S.C. 8287(a)(2)(A); FEMP ESA FAQ; FEMP microgrid fact sheet (2025).

Figure 34. Who does the O&M on federal paths: the same six duties as Figure 33. Gaiergy graphic based on the sources in the cards above.

10.9 What happens at year 25



Plan it on day one

- New York: decommissioning plan is a permit document; notify the code official first; cover fire-damaged equipment (NYSERDA BESS Guidebook 2024^[41])
- FEMP: submit the plan with the design; consider recycling and site restoration (FEMP Li-ion BESS spec 2025^[42])



Fund it

- New York model law: the owner keeps a fund or bond payable to the town for the life of the facility, with the cost estimate kept current (NYSERDA BESS Guidebook 2024^[41])
- Federal energy sales agreement: title passes at fair market value, funded through a reserve account held by the ESCO (FEMP ESA FAQ^[76])

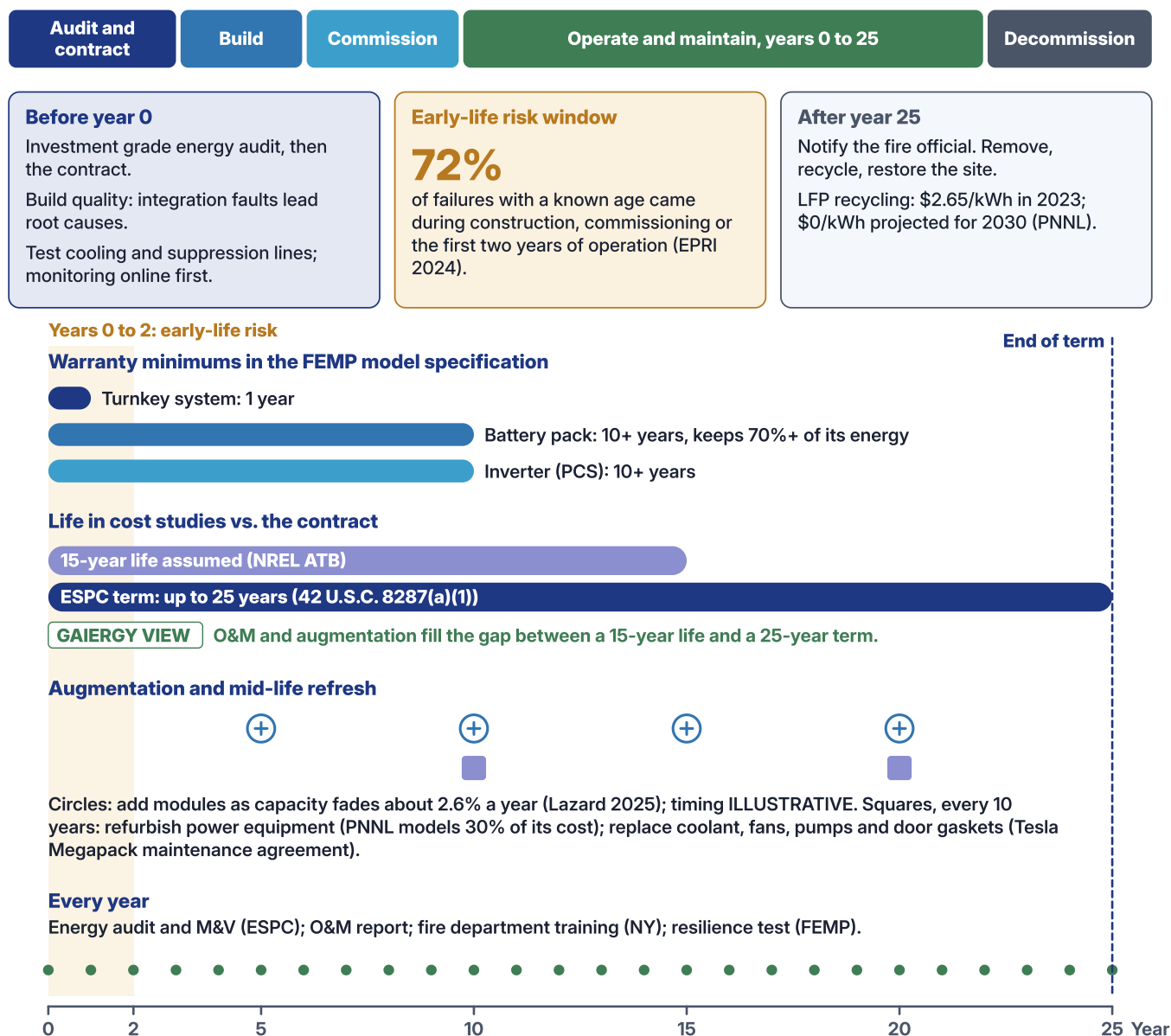


Recycle it

- PNNL: lithium iron phosphate cost a net \$0.50 to \$0.70 per pound to recycle (2021), forecast to reach \$0 by 2030 (PNNL-33283^[216])
- EPA: most spent lithium-ion batteries are likely ignitable and reactive hazardous waste; new rules are planned, not final (US EPA, Li-ion recycling^[230])
- All-in removal cost per kWh from a primary source: **UNCONFIRMED**

A battery's 25-year life, and where it can fail

Phases from audit to removal. Operating years are to scale.



Gaiergy illustration. Sources (accessed Oct. 2, 2026): EPRI, TWAICE and PNNL, Insights from EPRI's BESS Failure Incident Database (May 2024), pp. 8 and 11; DOE FEMP Li-ion BESS Technical Specifications (2025 template); NREL ATB 2024 and 2025 battery pages; 42 U.S.C. 8287(a)(1); Lazard LCOE+ (June 2025), LCOS v10.0; PNNL-33283 (2022), pp. 39 to 41; PNNL cost database v2024; Tesla Megapack Maintenance Agreement; NY Fire Code 1206.9.3; NY FSWG (July 2024); Energy Safe Victoria and Vistra findings; NC G.S. 143-64.17 (investment grade audit).

Figure 35. A battery's 25-year life: audit, build, commissioning, warranty, augmentation, refresh and decommissioning. Gaiergy graphic based on FEMP, PNNL and the New York code (FEMP Li-ion BESS spec 2025^[42]; PNNL-33283^[216]; NYSERDA BESS Guidebook 2024^[41]).

Recommendation: consider matching the O&M term to the contract term, and the contract term to the battery's planned life including augmentation. A 25-year payment schedule with a 5-year service contract leaves 20 years with nobody named. The owner then carries the risk that the EPRI data puts in operation, and the savings risk that one missed peak creates.

Real projects

THE ANSWER

Public and nonprofit batteries paid for by energy contracts exist at every level: cities, counties, state universities, schools, water and sewer districts, municipal utilities, hospitals and federal bases. **Most non-federal batteries found are owned by a developer or utility and bought as a service; federal ESPCs usually bundle the battery with fast-payback measures for resilience.** Local projects lean on demand charge cuts, grants and the storage tax credit, which since 2026 depends on the foreign-entity and domestic-content gates (Section 9).

Every kind of public and nonprofit owner has done it



Pin color = who owns or hosts the battery. The numbered list follows this map.

- | | | |
|------------------|---------------------------------------|-----------------------------|
| ● Federal agency | ● State or state university | ● City or town |
| ● County | ● School district or college district | ● Authority or public power |
| ● Airport | ● Public housing authority | ● Nonprofit |

Sources: owner, agency, utility and vendor documents listed with the numbered project list, accessed 2026-10-02 to 2026-10-03.
Map: us-atlas, Albers USA.

Figure 36. Where public batteries were paid for with energy contracts: 40 named projects, pinned by who owns or hosts the battery, across every kind of public and nonprofit owner. Gaiergy graphic based on the sources in the cards.

Federal, city, county and state owners

FEDERAL AGENCY

- 1 Marine Corps Recruit Depot Parris Island, SC**
Federal ESPC; 4 MW / 8 MWh; done 2019
- 2 Joint Base San Antonio (Lackland), TX**
Federal ESPC; 4 MW / 8 MWh; awarded 2018
- 3 Coast Guard Training Center Petaluma, CA**
Federal ESPC; 11.6 MWh; 2021
- 4 Norfolk Naval Shipyard, VA**
Federal ESPC; 3 MW (vendor); 2021
- 5 GSA Oklahoma City Federal Building, OK**
Federal UESC; 250 kW / 500 kWh; done 2023

CITY OR TOWN

- 6 City of San Diego, CA**
ESPC plus tax-exempt lease; nearly 4 MWh, portfolio; approved 2026
- 7 City of Berkeley, Live Oak Recreation Center, CA**
25-yr PPA under Gov. Code 4217, via Ava (public CCA); 387 kWh; 2024
- 8 Santa Barbara Fire Station One, CA**
City-owned battery, Cal OES grant; PPA solar; size UNCONFIRMED; 2021
- 9 New York City schools and DEP sites, NY**
NYPA-administered PPAs; up to 6.6 MW; 2021

- 10 Highland Park borough landfill, NJ**
PSE&G owns, in rates (Gaiergy view); 2,000 kWh; 2020

- 11 Pennington public works building, NJ**
PSE&G owns, in rates (Gaiergy view); 574 kWh; 2018

COUNTY

- 12 Monterey County Jail, CA**
PPA, developer owns; 1.043 MW / 2.087 MWh (press); 2025

- 13 Montgomery County EMTOC bus depot, MD**
Energy as a service; 2 MW / 6.9 MWh; 2026

- 14 Bayfield County courthouse and jail, WI**
Xcel program; county owns the battery; size UNCONFIRMED; 2023

STATE OR STATE UNIVERSITY

- 15 Sonoma State University, CA**
30-yr PPA, TotalEnergies; 1.55 MW or MWh (UNCONFIRMED); 2026

- 16 SUNY New Paltz, NY**
NYPA financed, college repays; size not published; 2018

- 17 University of Hawaii, five campuses, HI**
ESPC; storage owned by a third party; 41.8 MWh (vendor); 2017 to 2019

Sources: FEMP; PNNL-37058; GSA; Ameresco (vendor); City of San Diego, Berkeley and Santa Barbara council records; NY Governor and NYPA releases; PSE&G releases; Monterey County (press); Montgomery County; Xcel (press); Sonoma State; SUNY New Paltz; JCI (vendor). Accessed 2026-10-02 to 2026-10-03. Vendor and press = not yet confirmed by the owner.

Figure 37. Named projects on the map, list 1 of 2: federal, city, county and state owners; the numbers match Figure 36. Sources are in the project cards that follow.

Schools, districts, airports, housing and nonprofits

SCHOOL DISTRICT OR COLLEGE DISTRICT

- 18 Greenburgh Central School District, NY**
ESPC; 775 kW AC; awarded 2024
- 19 MSD of Wayne Township, IN**
Guaranteed savings contract; 720 kW / 1,548 kWh (vendor); 2023
- 20 Hopewell Valley Central High School, NJ**
PSE&G owns, in rates (Gaiergy view); 580 kWh (440 kWh per one slide: UNCONFIRMED); 2015
- 21 Mt. San Antonio College, CA**
\$49M energy services contract; Willdan owns (press); size UNCONFIRMED; 2026
- 22 John Hopkins Middle School, FL**
Duke Energy owns, in rates (Gaiergy view); 2.5 MW; planned

AUTHORITY, SPECIAL DISTRICT OR PUBLIC POWER

- 23 Sterling Municipal Light Department, MA**
Municipal light plant owns; grants; 2 MW / 3.9 MWh; 2016
- 24 Concord Municipal Light Plant, MA**
GO bonds in 2024 warrant; vote UNCONFIRMED; 4.99 MW / 14.97 MWh; planned
- 25 Wakefield (MMWEC member), MA**
Grant plus MMWEC pooled loan; 3 MW / 5 MWh; 2019
- 26 Irvine Ranch Water District, 6 sites, CA**
Third party owns (Macquarie); 6.25 MW / 35.7 MWh; 2018
- 27 McKinleyville Community Services District, CA**
Energy services contract plus O&M; 500 kW / 1,340 kWh (press); 2020

AIRPORT

- 28 Redwood Coast Airport (ACV), CA**
Public CCA owns; ground lease; 2.3 MW / 8.9 MWh; 2021

- 29 Chattanooga Airport (CHA), TN**
Municipal utility EPB owns; 560 kW / 510 kWh; 2018
- 30 Fresno Yosemite (FAT), CA**
Energy services agreement, 20 yr; 2,000 kW / 3,828 kWh; building
- 31 Columbia Metropolitan (CAE), SC**
EPC plus 5-yr O&M; grants, PFCs; size UNCONFIRMED; building
- 32 JFK Long Term Parking Lot 9, NY**
Developer build-own-operate, with NYPA; 7.5 MW; building
- 33 San Diego International (SAN), CA**
With ENGIE Storage; form UNCONFIRMED; 2 MW / 4 MWh (vendor); announced 2019

PUBLIC HOUSING AUTHORITY

- 34 Boston Housing Authority, 3 sites, MA**
State AMP storage grant; 385 kW / 1,686 kWh; awarded 2026
- 35 Worcester Housing Authority, Lafayette Place, MA**
State AMP storage grant; 125 kW / 261 kWh; awarded 2026
- 36 NYCHA Borinquen Plaza, NY**
With NYPA; contract UNCONFIRMED; size UNCONFIRMED; announced 2023

NONPROFIT

- 37 Hackensack Meridian Health, NJ**
30-yr energy as a service; size UNCONFIRMED; 2024
- 38 Kaiser Permanente Richmond Medical Center, CA**
State grant to the developer; 250 kW / 1 MWh; report 2019
- 39 Boston Medical Center, MA**
Owner purchase plus state grant; 572 kW; 2022
- 40 Cooper University Hospital, NJ**
PSE&G owns, in rates (Gaiergy view); 200 kWh; 2016

Sources: RWE; Veregy and Energy Toolbase (vendor); PSE&G PJM slides; Willdan and Microgrid Knowledge (press); Duke Energy; MMWEC; Sterling MLD; Concord 2024 warrant; IRWD; McKinleyville CSD; CEC-500-2026-006; EPB; Fresno City Council; flycae.com; PANYNJ and NYPA; ENGIE via Cleantech San Diego (vendor); Mass. DOER; NYCHA; ENFRA; CEC-500-2019-034; Clean Energy Group. Accessed 2026-10-02 to 2026-10-03.

Figure 38. Named projects on the map, list 2 of 2: schools, districts, airports, housing and nonprofits. Sources are in the project cards that follow.



City of San Diego, California

Energy and water savings contract; approved 2026

Nearly 4 MWh (City of San Diego EWSPC^[14])

- Tax-exempt lease of nearly \$112 million over 25 years; no upfront city capital (City of San Diego EWSPC^[14])
- The expected loss of the storage credit informed the removal of several sites (Section 9) (City of San Diego EWSPC^[14])



Montgomery County, Maryland

Energy as a service; completed 2026

2 MW / 6.9 MWh (Montgomery County 2026^[231])

- Transit depot microgrid; the private partner designed, built, owns, operates and maintains it, with no county capital (Montgomery County 2026^[231])
- \$1.6 million Maryland Energy Administration grant (Montgomery County 2026^[231])



County of Monterey, California

Power purchase; county jail; 2025

1.043 MW / 2.087 MWh

PRESS ONLY (Solar Power World 2026^[232])

- Developer owns and operates; "more than \$12 million" of lifetime savings **PRESS ONLY** (Solar Power World 2026^[232])



Highland Park, New Jersey

Utility owned on borough land; 2020

2,000 kWh (PSE&G 2020, Highland Park^[233])

- 605 kW of solar on a former borough landfill; PSE&G owns the system (PSE&G 2020, Highland Park^[233])



Berkeley, California

25-year agreement through Ava Community Energy; 2024

387 kWh (Berkeley Council 2024^[85])

- 201.9 kW of solar at a recreation center and corporation yard, under Government Code 4217 without bidding (Berkeley Council 2024^[85])
- Owner covers "operation, maintenance, and repair over the life of the contract" (Berkeley Council 2024^[85])



Sonoma State University, California

30-year contract; completed 2026

1.55 battery bank (MW or MWh) **UNCONFIRMED** (Sonoma State 2026^[17])

- With 4.1 MW of solar carports; almost \$1 million of savings in 2026 (Sonoma State 2026^[17])
- MW or MWh **UNCONFIRMED**



Cal Poly San Luis Obispo, California

Power purchase; planned

6 MW (Cal Poly project page^[234])

- About 5.25 MW of solar; project budget \$12 million; acceptance planned April 2027 (Cal Poly project page^[234])

Newark Board of Education, New Jersey



ESIP with Johnson Controls; contract approved 2021

\$95 million (Newark Board of Education ESIP page^[21])

- About 17 MW of solar by power purchase agreement, combined heat and power units, and upgrades at 60 schools (Newark Board of Education ESIP page^[21])
- The only battery named is storage for a stadium wind turbine's lighting; size not given (Newark Board of Education ESIP page^[21])

Greenburgh Central School District, New York



ESPC; awarded 2024

775 kW AC VENDOR (RWE 2024, Greenburgh^[20])

- \$20.5 million ESPC with 600 kW of carport solar VENDOR (RWE 2024, Greenburgh^[20])
- About \$2.5 million investment tax credit expected; who claims it not stated VENDOR (RWE 2024, Greenburgh^[20])

MSD of Wayne Township, Indiana



Guaranteed savings contract; 2022 to 2023

720 kW / 1,548 kWh VENDOR (Energy Toolbase, MSD Wayne^[235])

- \$26.5 million project VENDOR (Veregy 2023, MSD Wayne^[236])
- Batteries at six elementary schools for demand charge management VENDOR (Energy Toolbase, MSD Wayne^[235])

University of Hawaii community colleges



ESPC plus third-party solar and storage

41.8 MWh across five campuses (Gaiergy sum of the two figures below)

- Johnson Controls ESPC: \$81.7 million guaranteed savings over 14 years VENDOR (Johnson Controls, University of Hawaii^[237])
- Owned by Pacific Current: 7.7 MW of solar with 28.6 MWh of batteries on Oahu, and 2.8 MW of solar with 13.2 MWh at Maui College (UH News 2018^[238]; Johnson Controls, University of Hawaii^[237])

Roseburg Urban Sanitary Authority, Oregon



ESPC; 2025

186 kW VENDOR (Ameresco 2025, Roseburg^[239])

- Battery at the admin offices for "uninterrupted operations" VENDOR (Ameresco 2025, Roseburg^[239])
- Nearly \$2.9 million of grants; one grant of \$870,870 paid for 50 kW of solar and the battery VENDOR (Ameresco 2025, Roseburg^[239])

McKinleyville CSD, California



Energy services contract plus long-term O&M; 2020

500 kW / 1,340 kWh PRESS ONLY (Microgrid Knowledge, McKinleyville^[240])

- The 2020-02-05 board agenda lists approval and award of the Ameresco contract, with long-term O&M pricing (McKinleyville CSD agenda 2020^[241])
- Bid \$1.96 million, battery \$656,000 PRESS ONLY (Microgrid Knowledge, McKinleyville^[240])



Sterling, Massachusetts

Municipal light plant; 2016

2 MW / 3.9 MWh (Sterling MLD fact sheet^[57])

- About \$2.7 million; \$1,463,194 state grant and \$250,000 federal grant (Sterling MLD fact sheet^[57])
- About \$400,000 a year; backs up police and dispatch up to 12 days (Sterling MLD fact sheet^[57])
- Value mainly from monthly transmission and yearly capacity peak cuts (Sandia SAND2017-1093^[58])



Concord, Massachusetts

Municipal light plant; 2024 warrant

Up to \$10.4 million (Concord 2024 Warrant Art. 1^[108])

- The 2024 Special Town Meeting warrant asked to authorize general obligation bonds for a 4.99 MW / 14.97 MWh battery, repaid first from light plant revenue (Concord 2024 Warrant Art. 1^[108])
- Vote result **UNCONFIRMED**



MMWEC member towns, Massachusetts

Joint action agency

\$33.8 million saved, 2017 to 2024 (MMWEC energy storage page^[59])

- Grants plus pooled loans, developer-owned batteries, and shared savings contracts (MMWEC energy storage page^[59]; MMWEC 2026, West Boylston^[103])
- Savings from peak forecasting and dispatch (MMWEC energy storage page^[59])
- Wakefield: 3 MW / 5 MWh at Beebe Substation, 2019; state grant plus MMWEC pooled loan (MMWEC 2019, Wakefield^[242])



SUNY New Paltz, New York

NYPA financed; 2018

\$1.37 million total (SUNY New Paltz News 2018^[104])

- 217 kW solar plus battery at the emergency shelter gym (SUNY New Paltz News 2018^[104])
- Costs beyond \$461,000 of NYSERDA and Central Hudson funding were *"financed by NYPA and will be repaid by the College"*; battery kWh **UNCONFIRMED** (SUNY New Paltz News 2018^[104])



John Hopkins Middle School, Florida

Duke Energy owns; announced 2020

2.5 MW (Duke Energy 2020^[99])

- Announced 2020: 2.5 MW battery and 1 MW solar canopy at a special needs shelter (Duke Energy 2020^[99])
- Still described as planned in August 2022 (Duke Energy 2022^[100]); in-service date **UNCONFIRMED**; no host fee named **UNCONFIRMED**



SDG&E microgrids, California

Utility owned; ratepayers pay **GAIERGY VIEW**

About 39 MW / 180 MWh (SDG&E 2024^[243])

- Four substation microgrids backing up fire stations, libraries, schools and the sheriff (SDG&E 2024^[243])
- Ramona air attack base: 500 kW / 2,000 kWh with CAL FIRE and the US Forest Service (SDG&E 2022^[244])

Newark Housing Authority, New Jersey



Two HUD-approved energy performance contracts; no battery

\$134 million **VENDOR**
(Constellation, Newark Housing Authority^[30])

- Phase 1: \$50 million, estimated \$78 million of savings over 15 years; Phase 2: \$84 million, projected \$219 million over 20 years **VENDOR** (Constellation, Newark Housing Authority^[30])
- Five cogeneration units serve three high-rises and give power during outages; no battery was included (Constellation, Newark Housing Authority^[30])

Hackensack Meridian Health, New Jersey



30-year energy as a service; announced 2024

\$134 million **VENDOR** (ENFRA, HMH project page^[37])

- Nearly 98% of the scope is solar and battery storage at 18 hospitals **VENDOR** (ENFRA, HMH project page^[37])
- Battery size and completion **UNCONFIRMED**

Boston Medical Center, Massachusetts



Owner purchase with a state grant; 2022

572 kW (Clean Energy Group 2025, BMC^[245])

- Cost \$1,330,796; state grant \$402,500 (Clean Energy Group 2025, BMC^[245])
- \$83,400 a year of ConnectedSolutions payments (Clean Energy Group 2025, BMC^[245])

Worcester Housing Authority, Massachusetts



State grant; awarded 2026

125 kW / 261 kWh (Mass. DOER 2026^[28])

- \$521,640 grant for public housing for elderly and disabled residents (Mass. DOER 2026^[28])
- No housing authority battery under an energy contract was found

Vashon United Methodist Church, Washington



Owner purchase with direct pay; 2024

81 kWh (Clean Energy Group, Vashon UMC^[185])

- State grant plus the federal credit as a direct payment (Clean Energy Group, Vashon UMC^[185])

Kaiser Permanente Richmond, California



State grant; operating 2017

250 kW / 1 MWh (CEC-500-2019-034^[246])

- \$4.78 million state research grant; nonprofit hospitals "must rely on debt financing, cash expenditure, or third-party ownership and energy services agreements" (CEC-500-2019-034^[246])



Parris Island, South Carolina

Marine Corps; ESPC; completed 2019

4.0 MW / 8 MWh **VENDOR** (Ameresco 2019, Parris Island^[39])

- \$91 million project with no upfront capital **VENDOR** (Ameresco 2019, Parris Island^[39])
- Microgrid with solar and generation; saves \$6.9 million a year in utility and operating costs **VENDOR** (Ameresco 2019, Parris Island^[39])



Joint Base San Antonio, Texas

Air Force; ESPC; awarded 2018

4 MW / 8 MWh (FEMP, JBSA case^[247])

- \$132.1 million ESPC (FEMP, JBSA case^[247])
- Battery at Lackland with combined heat and power; over \$280 million guaranteed savings over the term (FEMP, JBSA case^[247])



Coast Guard Training Center Petaluma, California

ESPC; announced 2021

11.6 MWh (Ameresco 2021, Petaluma^[248]; PNNL-37058^[47])

- \$43 million ESPC per Ameresco **VENDOR** (Ameresco 2021, Petaluma^[248]; PNNL gives \$36.1 million over 21 years (PNNL-37058^[47]). Final value **UNCONFIRMED**
- With 5 MW of solar, to power the whole site in a utility outage (Ameresco 2021, Petaluma^[248])



Norfolk Naval Shipyard, Virginia

Navy; ESPC; announced 2021

3 MW **VENDOR** (Ameresco 2021, Norfolk^[249])

- \$173 million ESPC with a 19 MW combined heat and power plant **VENDOR** (Ameresco 2021, Norfolk^[249])
- Ameresco operates and maintains to January 2044; more than \$411 million guaranteed savings over 22 years **VENDOR** (Ameresco 2021, Norfolk^[249])



GSA Oklahoma City Federal Building

UESC with Oklahoma Gas and Electric; 2023

250 kW / 500 kWh (PNNL-37058^[47])

- UESC with the utility and its ESCO; ribbon cutting May 11, 2023 (GSA 2023^[250])
- A federal grant paid for the battery, “which had a longer payback period” (PNNL-37058^[47])



Fort Detrick, Maryland

Not an ESPC: an Army lease

6 MW / 6 MWh **VENDOR** (Ameresco 2022, Fort Detrick^[251])

- Battery added under a lease next to an existing solar supply agreement; planned to sell frequency regulation into PJM (US Army 2022, Fort Detrick^[252]) and act as a demand response asset **VENDOR** (Ameresco 2022, Fort Detrick^[251])
- The only federal battery found that was planned to earn grid market income; operation **UNCONFIRMED**

GAIERGY VIEW

The pattern across these projects: the battery rarely pays for itself alone. It rides inside a larger contract with faster-payback measures, or it leans on a grant. That makes the O&M terms easy to overlook, because the battery is a small line in a big contract. Recommendation: consider giving the battery its own O&M schedule, availability terms and reserve inside the larger contract.

Two sample sites

THE ANSWER

Two sample batteries show what O&M is worth in dollars over the contract term: a mid-size airport terminal on PG&E in California (25 years) and a city water plant on National Grid in Upstate New York (25 and 35 years). **Neglect cuts the airport's net cash from about \$8.01 million to \$2.58 million and turns the city's gain of about \$960,000 into a loss of about \$113,000. Paying for O&M that nobody checks is the worst case at both.** Every number in this section is an ESTIMATE from the Gaiergy sample-site model, with each input cited where it is used.

Each site is run three ways over a tax-exempt lease-purchase matched to its energy contract term: 25 years at 5.82% for the airport and the city, and 35 years at 5.98% as the city's second case, with no tax credit (Piper Sandler, Sept. 28, 2026^[253]; NY Energy Law 9-102, 9-103^[1]; Cal. Gov. Code 4217.10-.19^[12]) **ESTIMATE** :

**Cared for**

Full O&M at 4% of cost a year, including augmentation that keeps rated capacity through the term, with no separate replacement (NREL ATB 2025^[195]; NREL/TP-6A40-93281^[217]). The battery hits every monthly peak and is available 97% of the time **ESTIMATE** .

**Neglected**

No O&M spending beyond minor upkeep. The battery misses 3 of 12 monthly peaks, is 85% available, fades 2.6% a year with no top-up (Lazard LCOE+ 2025^[215]) and is retired below 60% of rated energy in year 21 (PNNL-33283^[216]) **ESTIMATE** .

**Paid for but not done**

The owner pays a full O&M contract, but the work is not done and nobody checks. The battery performs as if neglected. This is the real risk when only 28% of ESCOs give full-term M&V on public projects (LBNL ESCO report 2026^[109]) **GAIERGY VIEW** .

+\$8.01M

Airport, 25-year net cash, cared for; NPV +\$3.91 million; payback 4.9 years **ESTIMATE**

+\$2.58M / +\$620k

Airport, neglected / paid for but not done **ESTIMATE**

+\$960k

City, 25-year net cash, cared for; NPV +\$445,000; payback 10.3 years **ESTIMATE**

-\$113k / - \$1.10M

City, neglected / paid for but not done. Neglect costs the city \$1.07 million over 25 years and \$2.54 million over 35 **ESTIMATE**

Source of all four tiles: Gaiergy sample-site model, October 2026, with every input cited in the site panels below.

WHAT THE SAMPLES LEAVE OUT

- **No National Grid Term-DLM or Auto-DLM income.** Those programs pay only for load relief on the substation and feeders listed in each request for proposals (National Grid DLM RFP 2027^[52]).
- **No DLRP income at the city.** National Grid's Distribution Load Relief Program is open only to customers of the New Krumkill Substation (National Grid DLRP flyer^[51]). The city counts CSRP only.
- **No dollar value for backup power,** and no wholesale market income (Section 4).
- **No mid-life inverter refresh, insurance or decommissioning cost.** Each would lower all three results **ESTIMATE**.



Sample A: mid-size airport terminal

PG&E, California

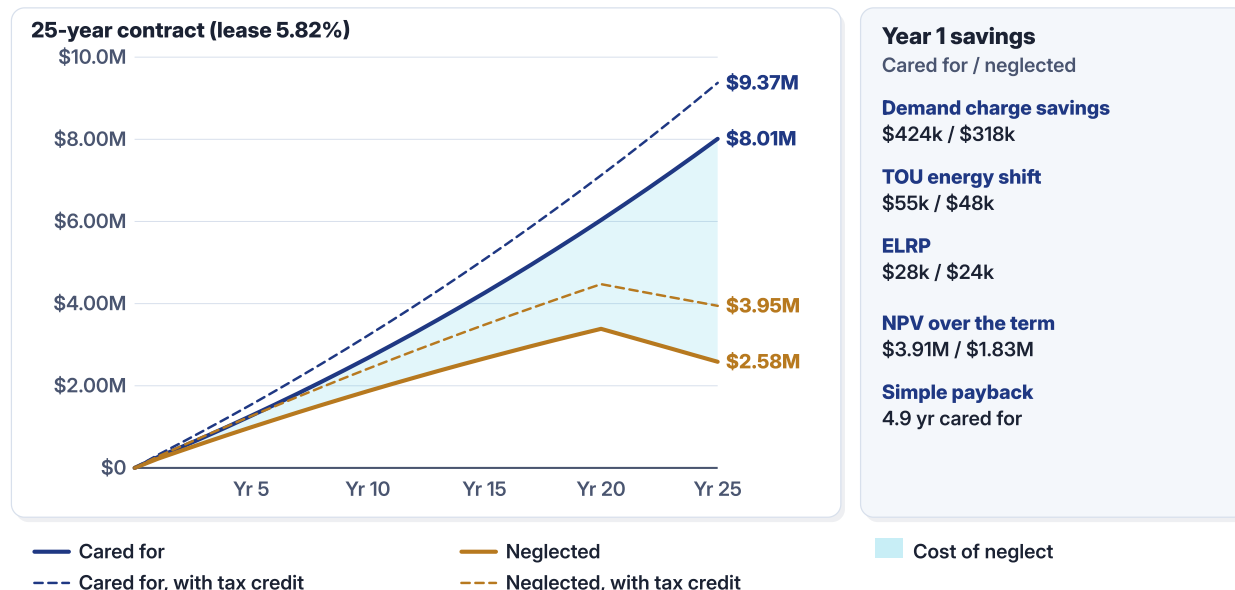
The airport owns the battery and pays from airport revenue, which stays inside the airport system (Section 8) (49 USC 47107^[23]), over a 25-year contract. PG&E's high demand charges carry this site (PG&E Schedule B-20^[254]). Neglect cuts the 25-year net cash from about \$8.01 million to about \$2.58 million. Paying for O&M that is not done leaves about \$620,000 **ESTIMATE**. Whether a given airport authority qualifies for direct pay is **UNCONFIRMED** (Section 9).

AIRPORT: terminal on PG&E, California

Sample airport: care is worth \$5.43M over a 25-year contract

ESTIMATE

2 MW / 4 MWh battery at a 4 MW airport terminal on PG&E Schedule B-20. Cumulative net cash after lease payments and O&M.



Sources: PG&E Electric Schedule B-20, Primary, effective March 1, 2026: maximum demand \$34.28/kW-month, summer peak demand \$43.88, winter peak \$2.34; peak energy \$0.17322 (summer) and \$0.14951 (winter) per kWh. CPUC ELRP: \$2/kWh non-residential, pilot through 2027 (2027 only; 4 events ESTIMATE). Peak cut 700 kW per month hit: ESTIMATE. Installed cost here \$520.44/kWh (PNNL 1 MW 2 h point, UNCONFIRMED for 2 MW / 4 h). Cared for: O&M 4% of cost per year including augmentation that keeps rated capacity through the term, no separate replacement (NREL ATB 2025); every monthly peak hit, 97% available. Neglected: minor maintenance \$3.17/kW-yr (PNNL v2024), capacity loss 2.6%/yr (Lazard LCOE+ June 2025), retired below 60% of rated energy (PNNL-33283), misses 3 of 12 monthly peaks, 85% available. Tax credit case: 34% by direct pay (26 USC 48E with domestic content, less 15% for tax-exempt financing: UNCONFIRMED); no-credit case 0%. Contract terms: NY Energy Law 9-103 (up to 35 years, capped at useful life); NJ ESIP law P.L.2012 c.55 (15 years); CA Gov. Code 4217.10 to 4217.19 (no cap; 25 years matches the federal ESPC maximum, 42 U.S.C. 8287). Lease-purchase rate matched to each term: AAA BVAL on Sept. 28, 2026 (10-year 4.16%, 20-year 4.91%, 30-year 5.23%) plus 0.75% ESTIMATE. Gaiergy sample-site model; every value is an ESTIMATE.

Figure 39. Sample airport battery: cumulative net cash after lease payments and O&M over a 25-year contract, cared for versus neglected. Gaiergy graphic from the Gaiergy sample-site model. Every value is an estimate. **ESTIMATE**

+\$3.91 million

NPV over a 25-year contract, cared for, no tax credit **ESTIMATE**

+\$1.83 million

NPV over 25 years, neglected, no tax credit **ESTIMATE**

\$5.43 million

Cost of neglect in net cash over 25 years **ESTIMATE**



THE SITE

- Mid-size airport terminal, peak load 4 MW **ESTIMATE**
- PG&E Schedule B-20, primary voltage, effective March 1, 2026: maximum demand \$34.28 per kW-month; summer peak demand \$43.88, winter \$2.34; peak energy \$0.17322 (summer) and \$0.14951 (winter) per kWh (PG&E Schedule B-20^[254])



THE BATTERY

- 2 MW / 4 MWh, lithium iron phosphate; installed cost \$520.44 per kWh (PNNL cost database 2024^[255]) (1 MW, 2-hour point; for 2 MW / 4 h **UNCONFIRMED**), so \$2.08 million **ESTIMATE**
- Peak cut 700 kW in each month the peak is hit **ESTIMATE**; round-trip efficiency 85% (NREL ATB 2024^[194])



HOW IT IS PAID

- Energy contract under California Gov. Code 4217.10 to 4217.19, which states no term cap (Cal. Gov. Code 4217.10-.19^[12]); 25 years matches the federal ESPC maximum (42 USC 8287^[7])
- Lease-purchase 25 years at 5.82%: payment \$160,100 a year; with a 34% direct-pay credit (\$707,800) \$105,600 **ESTIMATE** (Piper Sandler, Sept. 28, 2026^[253]; 26 USC 48E^[147]; 26 USC 45^[193]); financing cut **UNCONFIRMED**



WHAT IT EARNS IN YEAR 1

- Demand charge savings \$423,900 **ESTIMATE**
- Time-of-use energy shift \$55,300 **ESTIMATE**
- ELRP \$27,900: \$2 per kWh, 4 events, pilot through 2027 only (CPUC ELRP page^[56]) **ESTIMATE**



WHAT CARE COSTS

- Cared for: O&M 4% of cost a year, \$83,300 in year 1, including augmentation that keeps rated capacity through the term; no separate replacement (NREL ATB 2025^[195]; NREL/TP-6A40-93281^[217]) **ESTIMATE**
- Neglected: minor maintenance only, \$6,300 (PNNL cost database 2024^[255]); loses 2.6% of capacity a year (Lazard LCOE+ 2025^[215]); retired below 60% of rated energy in year 21 (PNNL-33283^[216]) **ESTIMATE**



WHAT HAPPENS OVER 25 YEARS

- Cared for: net cash +\$8.01 million, NPV +\$3.91 million, payback 4.9 years; with the credit +\$9.37 million **ESTIMATE**
- Neglected: net cash +\$2.58 million, NPV +\$1.83 million **ESTIMATE**
- Neglected while still paying a full O&M contract: +\$619,800 **ESTIMATE**



Sample B: city water plant

National Grid, Upstate New York

The city owns the battery and pays through a tax-exempt lease-purchase over its energy contract term; New York allows up to 35 years, capped at useful life (NY Energy Law 9-102, 9-103^[1]). The demand charge cut carries the case; CSRP adds a little (National Grid Upstate NY DR page^[50]). Cared for, the 1 MW / 2

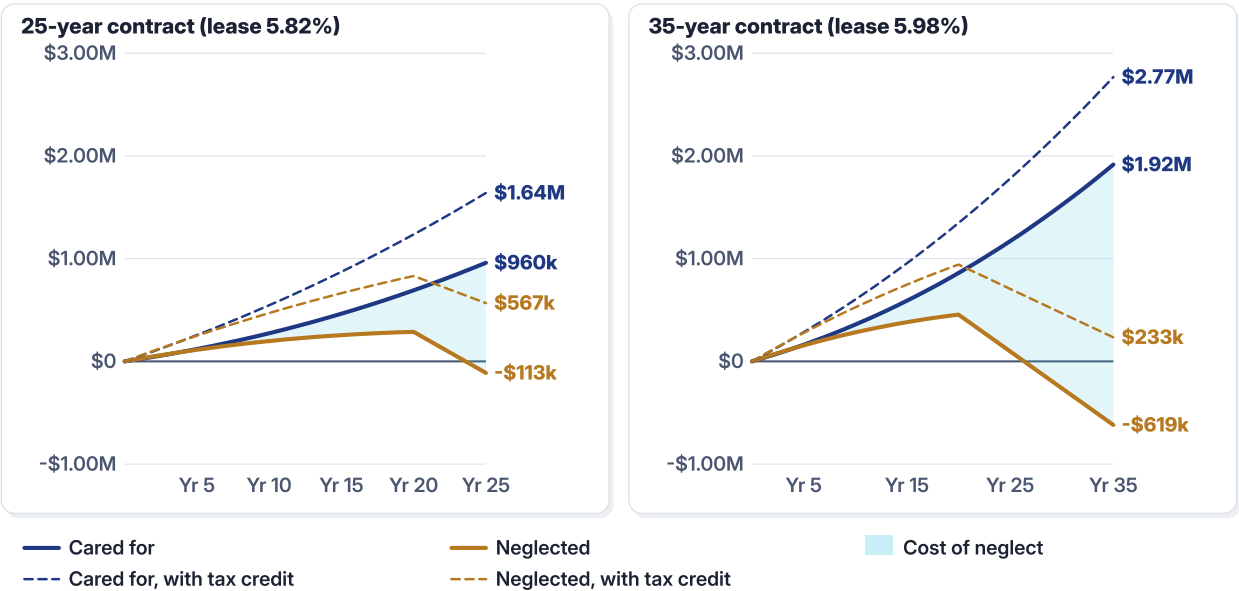
MWh battery leaves the city about \$960,000 ahead over 25 years. Neglected, it loses about \$113,000; neglect costs \$1.07 million over 25 years and \$2.54 million over 35. Paying for O&M that is not done loses about \$1.10 million ESTIMATE.

CITY: water plant on National Grid, Upstate New York

Sample city: care is worth \$1.07M over 25 years, \$2.54M over 35

ESTIMATE

1 MW / 2 MWh battery at a 1.5 MW water plant on National Grid Upstate NY, SC-3. Cumulative net cash after lease payments and O&M.



NPV, cared for vs. neglected, no credit: +\$445k vs. +\$81k (25 years); +\$672k vs. +\$67k (35 years).
Simple payback 10.3 years cared for.

Sources: National Grid SC-3 Primary demand charge \$14.14/kW-month (effective date UNCONFIRMED); National Grid CSRP \$2.75/kW-month and \$0.18/kWh, 4-hour window (DR Incentive Statement No. 7). Demand cut = usable kWh / 2.25-hour monthly peak, at most 1,000 kW: ESTIMATE. No Term-DLM or Auto-DLM revenue. Installed cost \$520.44/kWh (PNNL Energy Storage Cost and Performance Database v2024, LFP 1 MW 2 h). Cared for: O&M 4% of cost per year including augmentation that keeps rated capacity through the term, no separate replacement (NREL ATB 2025); every monthly peak hit, 97% available. Neglected: minor maintenance \$3.17/kW-yr (PNNL v2024), capacity loss 2.6%/yr (Lazard LCOE+ June 2025), retired below 60% of rated energy (PNNL-33283), misses 3 of 12 monthly peaks, 85% available. Tax credit case: 34% by direct pay (26 USC 48E with domestic content, less 15% for tax-exempt financing: UNCONFIRMED); no-credit case 0%. Contract terms: NY Energy Law 9-103 (up to 35 years, capped at useful life); NJ ESIP law P.L.2012 c.55 (15 years); CA Gov. Code 4217.10 to 4217.19 (no cap; 25 years matches the federal ESPC maximum, 42 U.S.C. 8287). Lease-purchase rate matched to each term: AAA BVAL on Sept. 28, 2026 (10-year 4.16%, 20-year 4.91%, 30-year 5.23%) plus 0.75% ESTIMATE. Gaiergy sample-site model; every value is an ESTIMATE.

Figure 40. Sample city battery: cumulative net cash after lease payments and O&M over 25- and 35-year contracts, cared for versus neglected. Gaiergy graphic from the Gaiergy sample-site model. Every value is an estimate. ESTIMATE

+\$444,800

NPV over a 25-year contract, cared for, no tax credit. Gaiergy sample-site model, October 2026 **ESTIMATE**

\$1.07 million

Cost of neglect in net cash over 25 years **ESTIMATE**

\$2.54 million

Cost of neglect in net cash over 35 years **ESTIMATE**



THE SITE

- Municipal water or wastewater plant, peak load 1.5 MW **ESTIMATE**
- National Grid Service Classification 3, Large General (National Grid SC-3 rates^[256]); delivery demand charge \$14.14 per kW-month, primary voltage (National Grid SC-3 rates^[256]); effective date not shown

UNCONFIRMED



THE BATTERY

- 1 MW / 2 MWh, lithium iron phosphate; installed cost \$520.44 per kWh (PNNL cost database 2024^[255]), so \$1.04 million **ESTIMATE**
- A 1 MW / 4 MWh option was tested and loses: NPV -\$271,600 over 25 years, -\$50,100 over 35 **ESTIMATE**
- Round-trip efficiency 85% (NREL ATB 2024^[194]); depth of discharge 90% (Lazard LCOE+ 2025^[215])



HOW IT IS PAID

- Energy contract under New York Energy Law 9-103, up to 35 years capped at useful life (NY Energy Law 9-102, 9-103^[1]); lease-purchase matched to the term **ESTIMATE**
- 25 years at 5.82%: payment \$80,000 a year; 35 years at 5.98%: \$71,600 **ESTIMATE**. Rate = AAA municipal yield at the term on Sept. 28, 2026 (Piper Sandler, Sept. 28, 2026^[253]) plus 0.75% **ESTIMATE**
- With a direct-pay credit of 34% (\$353,900): \$52,800 a year over 25 years **ESTIMATE** (26 USC 48E^[147]; 26 USC 7701^[188]; 26 USC 6417^[36]); tax-exempt financing cut (26 USC 45^[193]) **UNCONFIRMED**



WHAT IT EARNS IN YEAR 1

- Demand charge savings \$135,700: 800 kW less billed demand each month **ESTIMATE**
- CSRP \$7,300: \$2.75 per kW-month, May to September, plus \$0.18 per kWh, on a 450 kW pledge (National Grid Upstate NY DR page^[50]; NMPC DR Incentive Statement No. 7^[257]; National Grid CSRP guidelines^[258]) **ESTIMATE**
- DLRP \$0: open only at the New Krumkill Substation (National Grid DLRP flyer^[51]). No Term-DLM or Auto-DLM: they pay only on the feeders listed in each request for proposals (National Grid Upstate NY DR page^[50])



WHAT CARE COSTS

- Cared for: O&M 4% of cost a year, \$41,600 in year 1, including augmentation that keeps rated capacity through the term; no separate replacement (NREL ATB 2025^[195]; NREL/TP-6A40-93281^[217]); others augment the same way to a 20 to 25 year life (PNNL-33283^[216]); beyond 25 years **ESTIMATE**
- Neglected: minor maintenance only, \$3.17 per kW-year (PNNL cost database 2024^[255]), \$3,200; loses 2.6% of capacity a year (Lazard LCOE+ 2025^[215]) and is retired below 60% of rated energy, in year 21 (PNNL-33283^[216]) **ESTIMATE**
- O&M costs rise 2.5% a year (Lazard LCOE+ 2025^[215])



WHAT HAPPENS OVER THE CONTRACT TERM

- 25 years, cared for: net cash +\$959,700, NPV +\$444,800, payback 10.3 years; with the credit +\$1.64 million **ESTIMATE**
- 25 years, neglected (misses 3 of 12 monthly peaks, 85% available): net cash -\$113,100, NPV +\$81,200 **ESTIMATE**
- 35 years: cared for +\$1.92 million (NPV +\$671,700); neglected -\$619,100 (NPV +\$67,200) **ESTIMATE**
- Neglected while still paying a full O&M contract: -\$1.10 million over 25 years **ESTIMATE**
- Utility rates rise 1.73% a year, the 2014 to 2024 US commercial trend (EIA Electric Power Annual^[259])

GAIERGY VIEW

The samples make Section 10 concrete. O&M is not an overhead line: at the city it is the difference between a gain and a loss. The worst result at both sites is not neglect; it is paying for care that never happens. That is why Section 14 lists full-term M&V first. Recommendation: consider tying every O&M payment to a monthly report that shows each peak caught or missed.

Solar, storage and EV charging together

THE ANSWER

Solar makes the battery pay back faster, and at a busy airport garage solar plus battery plus EV charging pays back fastest in all three states. Solar and a battery together cut more of the demand charge than either one alone, and solar can recharge the battery in a long outage if the system can run on its own. Selling a kWh to an EV earns about 3 to 4 times or more what exporting it earns. The charger earns that price on grid power too; at the airport garage, solar and the battery add about 3 to 6 cents of margin on each kWh sold **ESTIMATE**. A 200-stall municipal garage does not pay at today's EV rates **ESTIMATE**.

13.1 Pair solar with the battery

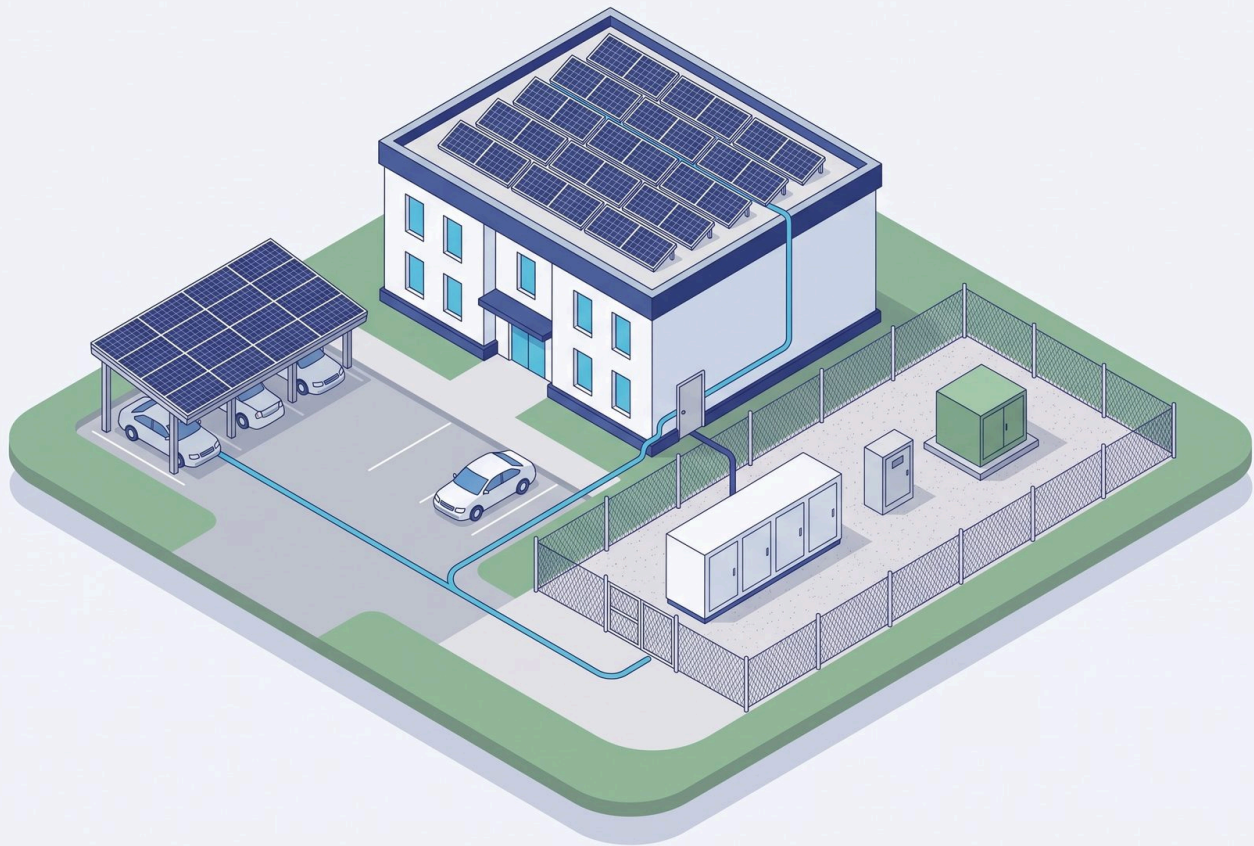


Figure 41. Solar by day, battery at the peak. Illustration, Gaiergy.

Researchers at Lawrence Berkeley National Laboratory (LBNL) and NREL ran 17 years of weather through 15 commercial building types in 15 US cities. With a basic demand charge, the median cut was 42% for solar and storage together, 8% for solar alone and 23% for storage alone (LBNL and NREL 2017^[260]). The pair beats the sum of its parts for two reasons. Solar leaves “*narrow peaks*” in the building's load that a battery can

easily clip, and the battery covers the dips when clouds pass (LBNL and NREL 2017^[260]). The study's batteries ran with “*perfect foresight*” (LBNL and NREL 2017^[260]), so treat these numbers as best cases.



Bigger demand-charge cut

Solar plus storage cut demand charges in every building type studied; solar alone did almost nothing for some (LBNL and NREL 2017^[260])



New York City sites

At a high school storm shelter, a fire station and a senior center, storage was cost-effective at all three, and storage savings helped pay for solar that did not pay alone (NREL/TP-7A40-66617^[261])



Count resilience, size up

At a primary school, valuing outages grew the best solar size by nearly 20% and the battery more than 13 times, and more than doubled the net benefit; the outages modeled lasted about 2 hours (NREL/FS-6A20-70679^[262])

GAIERGY VIEW

This is how solar helps the battery pay back sooner: together they capture more of the demand charge than the two would capture apart, so more savings are left to repay the contract. The battery does not need solar to earn the federal storage credit (26 USC 48E^[147]); pairing is an economic choice, not a tax condition.

13.2 Resilience: solar refills the battery

A battery alone gives backup for “*minutes to hours*”. Paired with an on-site renewable source, it can give backup for “*days to weeks*” (NREL resilience slides 2021^[263]). How long depends on the battery's charge, the critical load and the sun at the time of the outage (NREL REopt, Department of Defense case^[264]).



Battery alone

Minutes to hours

Backup ends when the battery is empty (NREL resilience slides 2021^[263])



Battery plus solar

Days, if it can island

At a Department of Defense base, the least-cost solar and battery design added one day at a 90% chance of riding through an outage; another design added four days for \$0.1 million more life-cycle cost (NREL REopt, Department of Defense case^[264])



Solar, battery and generator

Lowest-cost long backup

NREL's New York City study found this hybrid gave emergency power at the lowest life-cycle cost, and solar cut generator fuel use by about 9% to 36% (NREL/TP-7A40-66617^[261])

Solar can only refill the battery during an outage if the system can island, which means it disconnects from the grid and runs the building on its own. New York's interconnection rules do not let a system island on the utility's lines (NY SIR 2026^[265]), so it needs its own switch to separate. NREL puts the added cost to island at 10% to 50% of the system cost, from anecdotal experience; in its 21 scenarios, the most a site could pay and

still come out ahead was 3% to 21%, an average of 12% (NREL/FS-6A20-70679^[262]). Sizing for a full week costs money: a sample design with a 72% chance of carrying the critical load for 7 days had a negative net present value, and January was its weakest month (NREL 76678^[266]).

COUNTERPOINT

- New Jersey's Board of Public Utilities found in 2021 that renewables, alone or with storage, could not yet give critical facilities *"the level and length of resilience"* they need, and kept fossil fuel generation in its town center microgrids (NJ BPU TC DER Phase II order^[267]).
- New York City limits on-site diesel to 250 gallons; a 200 kW generator at half load uses that in just under 30 hours (NREL/TP-7A40-66617^[261]).

GAIRGY VIEW

Solar plus storage stretches backup from hours to days for a right-sized critical load. For multi-day winter outages at a critical facility, consider keeping or adding a generator.

13.3 What one solar kWh earns

Public fast charging sells near 45 to 50 cents per kWh. City-owned fast chargers in New York City charge \$0.39 per kWh, and the New York Power Authority's charge \$0.47 upstate and \$0.52 downstate (NYC DOT, Electric Vehicles^[268]; NYPA EVolve NY^[269]). Hoboken's city fast charger charges \$0.49 (City of Hoboken 2023^[270]). In California the national networks average \$0.65 to \$0.71 per kWh by state, according to a third-party tracker **SECONDARY** (DCFC Tracker, EVgo (third party)^[271]; DCFC Tracker, Electrify America (third party)^[272]; DCFC Tracker, Tesla (third party)^[273]). Level 2 chargers sell for less: \$0.27 in New York City garages, and \$0.25 to \$0.45 in San Jose, where \$0.45 is the 4 to 9 p.m. peak price (NYC DOT municipal parking list^[274]; City of San Jose EV chargers^[275]).

WHERE	HOW AN EXPORTED SOLAR KWH IS PAID	EXPORT VALUE PER KWH ESTIMATE	CHARGER SALE PRICE (\$0.45 TO \$0.50) AGAINST THE EXPORT VALUE, GROSS, BEFORE THE COST OF POWER ESTIMATE
New York, National Grid upstate	Value Stack credits (National Grid VDER-CRED Statement 109 ^[276] , NYISO day-ahead zonal prices, 2025 ^[277])	\$0.116 to \$0.122	3.7 to 4.3 times

WHERE	HOW AN EXPORTED SOLAR KWH IS PAID	EXPORT VALUE PER KWH ESTIMATE	CHARGER SALE PRICE (\$0.45 TO \$0.50) AGAINST THE EXPORT VALUE, GROSS, BEFORE THE COST OF POWER ESTIMATE
New York City, Con Edison	Value Stack, with a high summer peak credit (Con Edison VDER-CRED, October 2026 ^[278] ; NYISO day-ahead zonal prices, 2025 ^[277])	\$0.195 to \$0.215	2.1 to 2.6 times
New Jersey, PSE&G, netted within the year	Credit at the retail per-kWh rate (N.J.A.C. 14:8-4.3 ^[279] ; PSE&G Price to Compare, June 2026 ^[280] ; PSE&G tariff No. 17 ^[281])	about \$0.10	4.4 to 4.9 times
New Jersey, PSE&G, above annual use	Wholesale price at the annual true-up (N.J.A.C. 14:8-4.3 ^[279] ; PJM State of the Market 2025 ^[282])	\$0.043	10.5 to 11.6 times
California, PG&E	Net Billing Tariff export credit (PG&E Schedule NBT ^[283] ; PG&E 2026 export credit values ^[284])	\$0.056	8.0 to 8.9 times
California, SDG&E	Net Billing Tariff export credit (SDG&E 2026 export prices ^[285])	\$0.045	9.9 to 11.0 times

Export values are Gaiergy estimates: each utility's posted export credits weighted by an hourly solar profile for the area (NLR PVWatts v8^[286]), 2025 to 2026 rates. The times column is the EV price divided by the export value.

Put plainly: **selling a kWh to an EV earns about 3 to 4 times or more what exporting it earns**; the multiple is lower in New York City, where Con Edison's summer peak credit is high. **The charger earns that price on grid power too.** Solar's own added value is cutting the cost of each kWh the charger sells, by about 3 to 6 cents at the airport garage (13.4) [ESTIMATE](#). A charged kWh sells for 2.4 to 5.5 times against the on-site

value of a solar kWh (\$0.086 in New York, \$0.102 in New Jersey, \$0.148 in California), and 3.2 to 5.5 times for fast charging at \$0.475 **ESTIMATE**.

READ WITH CARE

- The 45 to 50 cents is gross revenue. The fair comparison takes off battery losses, charger network and payment fees, and any demand charges the chargers add. The garage model assumes about 85% of stored energy comes back out (round trip) **ESTIMATE**.
- A kWh earns the EV price only when a car buys it; the airport garage model counts three shifts of drivers a day (13.4).

13.4 Parking garages: solar, battery and EV chargers

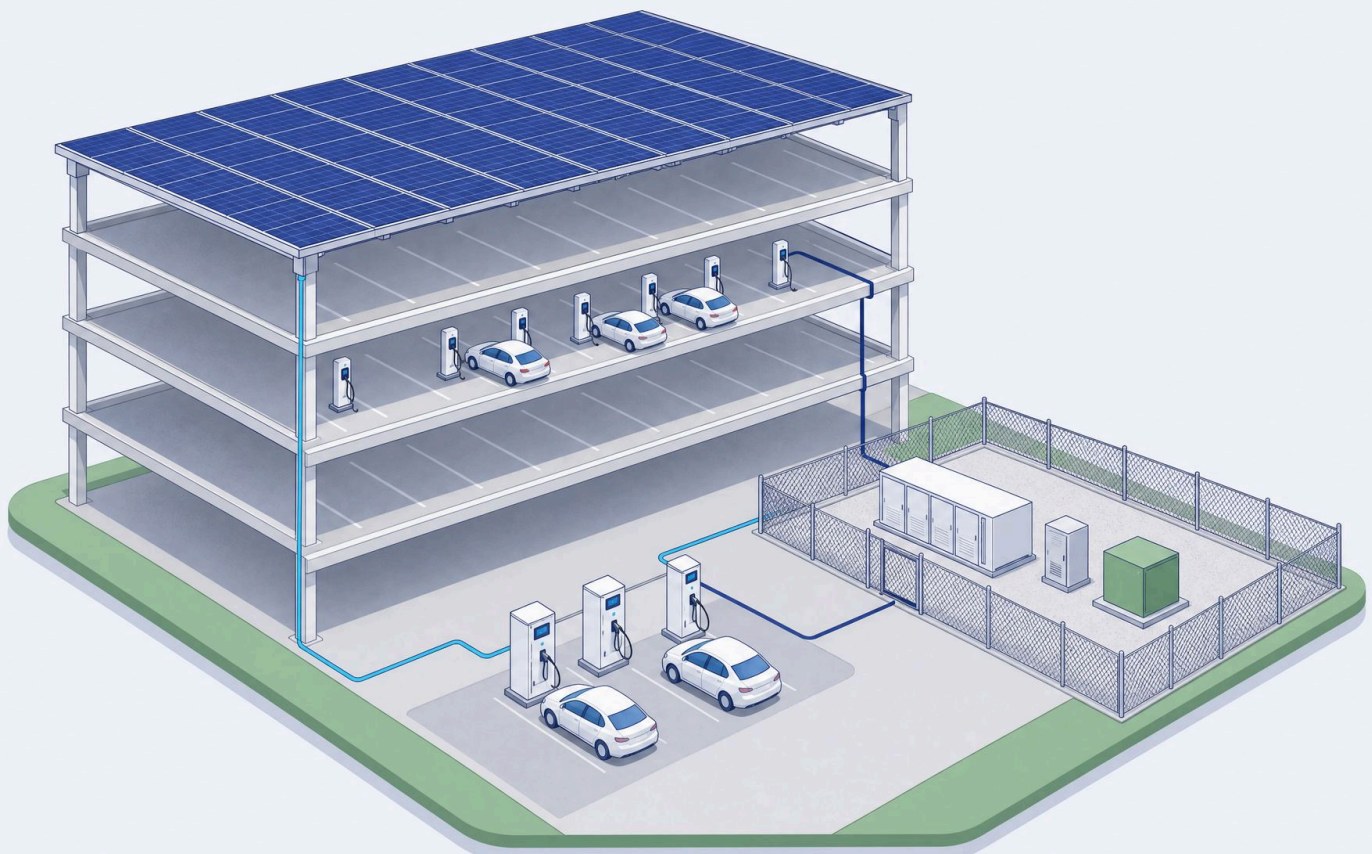


Figure 42. A public garage: solar canopy on the top deck, battery at ground level, fast chargers where drivers park. Illustration, Gaiergy.

Solar can feed cars directly in daylight. The battery earns its place by moving solar into the evening, keeping the site's peak down and carrying the site in an outage **GAIERGY VIEW**. New EV rates change the battery's

job. National Grid's EV Phase-In Rate charges no distribution demand charge in Tier 1, for sites with a load factor of 10% or less, and new sites start in Tier 1 (National Grid EV Phase-In Rate Guide^[287]). Con Edison uses the same four-tier design (Con Edison EV Phase-In Rates^[288]), and New York's Public Service Commission approved a 50% demand charge rebate for many EV charging sites (NY PSC, Case 22-E-0236^[289]). PG&E's business EV rate replaces the demand charge with a kW subscription (PG&E Schedule BEV^[290]). So at a new garage, the battery's main work moves from cutting demand charges to moving solar into the evening, keeping the site in a low tier or under its subscription, and backup GAIERGY VIEW.

Gaiergy modeled two public garages in all three states, each over its energy contract term: New York 25 years (35 as a second case) (NY Energy Law 9-102, 9-103^[1]), New Jersey 25 years, through a contracting path outside ESIP (ESIP caps at 15 years) (NJ P.L.2009 c.4; P.L.2012 c.55^[11]; NJ P.L.2012 c.55^[27]) and California 25 years (Cal. Gov. Code 4217.10-.19^[12]; 42 USC 8287^[7]). The **airport garage** has 1,000 stalls, 200 Level 2 ports serving three shifts a day at 30 kWh a session, each car charging at no more than 11.5 kW (Tesla Wall Connector^[291]), and 10 fast-charging stalls (EVgo Q2 2026 results^[292]) ESTIMATE. The **municipal garage** has 200 stalls, 40 Level 2 ports and 2 fast-charging stalls ESTIMATE. Three set-ups: **A** a battery only, **B** solar plus a battery, **C** solar plus a battery plus EV charging sales. Batteries of 1, 2 and 5 MW were tested, never below 1 MW, and the one with the best NPV over each state's contract term was kept GAIERGY VIEW. A battery cuts the grid service a garage needs by 50% to 80% at most (NREL, battery-buffered fast charging^[293]); avoided service is valued at \$120 per kW (ESTIMATE: Gaiergy proxy from National Grid upstate New York upgrade costs, about \$600,000 per 5 MW (2026)). The solar canopy premium is \$0.45 per watt for a new garage and \$0.95 at an existing garage ESTIMATE, checked against the published \$0.89 to \$0.97 (MA DOER SMART review, 2024^[294]).

AIRPORT GARAGE, CONTRACT TERM	A. BATTERY ONLY	B. SOLAR + BATTERY	C. + EV CHARGING	B WITH BOTH CREDITS	MANAGED CHARGERS, NO BATTERY
New York, 25 years	+\$1.31M (8.6 yr)	-\$0.46M (16.1 yr)	+\$6.68M (7.1 yr)	+\$0.83M	+\$8.55M
New York, 35 years	+\$1.79M	+\$0.08M	+\$8.53M	+\$1.36M	+\$10.11M
New Jersey, 25 years, outside ESIP	-\$0.01M (14.7 yr)	-\$0.02M (11.6 yr)	+\$10.52M (4.6 yr)	+\$0.92M	+\$11.41M
California, 25 years	+\$0.95M	+\$0.93M	+\$9.36M (5.9 yr)	+\$2.15M	+\$8.55M

Net present value over the contract term, no credits unless stated; payback in years where shown. Credits: battery 34% and solar 25.5% by direct pay (26 USC 48E^[147]; 26 USC 45Y^[148]). All values **ESTIMATE**, Gaiergy garage model.

NEW JERSEY'S 15-YEAR LIMIT

New Jersey's public owners use the Energy Savings Improvement Program (ESIP), which caps the contract at 15 years (20 only for combined heat and power) (NJ P.L.2012 c.55^[27]). At that limit a battery-only project does not pay back. A battery lasts 20 years or more, so this report models New Jersey at 25 years. We encourage New Jersey, and states with similar limits, to rewrite the term limit on these energy contracts or to use a different contracting path **GAIERGY VIEW**.



Busy airport garages pay fastest

Solar plus battery plus EV charging (C) has the best NPV of the three set-ups in all three states: +\$6.68 million in New York, +\$10.52 million in New Jersey and +\$9.36 million in California, with payback of 4.6 to 7.1 years **ESTIMATE**



Managed chargers are strong too

Chargers with load management and no battery reach +\$8.55 million in New York, +\$11.41 million in New Jersey and +\$8.55 million in California, beating C in New York and New Jersey **ESTIMATE**. There the battery's added edge is backup power and room to grow

GAIERGY VIEW



A 200-stall garage does not pay

The municipal garage is negative in every case. EV rates already remove most of the demand charge a battery would cut (PG&E Schedule BEV^[290]; National Grid EV Phase-In Rate Guide^[287]). The best case, California C, is -\$0.20 million; with both credits the full package turns positive in California (+\$0.30M) and New Jersey (+\$0.22M) **ESTIMATE**

**\$0.136 →
\$0.185**

New York: margin per kWh sold at the airport garage, grid only to solar plus battery **ESTIMATE**

**\$0.159 →
\$0.187**

New Jersey, same comparison

ESTIMATE

**\$0.151 →
\$0.212**

California, same comparison

ESTIMATE

**2.4 to
5.5x**

A charged kWh against the on-site value of a solar kWh (3.2 to 5.5 times for fast charging)

ESTIMATE

WHEN A 200-STALL GARAGE PAYS

A 200-stall garage is not economical for a battery today. With solar and EV charging it is close now, positive with tax credits in New Jersey and California, and NREL's battery cost forecasts put it at break-even by about 2028 to 2031. A battery on its own needs a price drop of 40% or more, which is likely after 2031. New York's full package needs about a 48% drop **ESTIMATE**. Gaiergy garage model, with NREL's moderate battery cost projection and BloombergNEF pack prices (NREL/TP-6A40-93281^[217]; BNEF 2023 price survey^[295]; BNEF 2024 price survey^[296]; BNEF 2025^[297]).

Selling a kWh to an EV earns about 3 to 4 times or more what exporting it earns. The charger earns that price on grid power too. Solar and the battery add about 3 to 6 cents of margin on each kWh sold at the

airport garage, and the battery adds value by cutting charger peaks and the grid service the garage needs **ESTIMATE**. Level 2 ports serve parkers well but sell few kWh each; the revenue case rests on a busy garage.

 Battery Keeps the federal credit Storage is exempt from the wind and solar cutoff; the storage credit phases down only for construction starting in 2034 and later (26 USC 48E^[147]; 26 USC 45V^[148])	 Solar Placed in service by 2027 No credit for solar placed in service after December 31, 2027 (26 USC 48E^[147]); the exception for solar that began construction by July 4, 2026 has passed (Pub. L. 119-21^[298])	 Chargers No 30C after June 30, 2026 The charger credit does not apply to property placed in service after June 30, 2026 (26 USC 30C^[299]; Pub. L. 119-21^[298])
---	---	--

WHAT THE MODEL COULD NOT CONFIRM

- Charger maintenance, network and payment fees: \$500 per port and \$4,000 per stall a year plus 5% of sales **UNCONFIRMED**
- New York garage supply price: the S.C. 2ND Central zone value stands in for S.C. 3 (National Grid supply statement 181^[300]) **UNCONFIRMED**
- The cut of up to 15% in tax credits for tax-exempt financing, as applied to a lease-purchase (26 USC 45^[193]) **UNCONFIRMED**
- Whether the solar panels meet the foreign-entity rule for the credit (Pub. L. 119-21^[298]) **UNCONFIRMED**
- New Jersey's \$20 public-entity adder on top of \$110 per SREC-II (NJ BPU ADI order, May 21, 2026^[301]) **UNCONFIRMED**
- Avoided service at \$120 per kW is a Gaiergy proxy, and the canopy premium is a Gaiergy estimate; use the utility's study and a local bid **ESTIMATE**

The sample garages: airport first, then municipal

Two garages, three states, each on its energy contract term. Airport garage: 1,000 stalls on 5 levels; 200 Level 2 ports (20% of stalls, as NYC Local Law 55 requires for new garages (NYC Local Law 55 of 2024^[302])) serving three shifts a day, 30 kWh per session, each car charging at no more than 11.5 kW (Tesla Wall Connector^[291]); 10 DC fast stalls (150 kW) at 276 kWh a day (EVgo Q2 2026 results^[292]) **ESTIMATE**. Municipal garage: 200 stalls, 40 Level 2 ports, 2 DC fast stalls **ESTIMATE**. Solar canopy on the top deck, 4.75 kWdc per stall **ESTIMATE**: \$1.98 per watt rooftop benchmark (NREL 2025Q1 PV benchmark^[303]) plus a canopy premium of \$0.45 per watt for a new garage, \$0.95 at an existing garage timed to the deck membrane replacement (\$1.02 off-cycle, comparison only); Gaiergy bottom-up **ESTIMATE**, in line with the published \$0.89 to \$0.97 (MA DOER SMART review, 2024^[294]). Canopy output 5% below ground mount and O&M 20% higher (MA DOER SMART review, 2024^[294]); output falls 0.5% a year (NREL/TP-7A40-73822^[218]). Chargers: Level 2 \$6,518 per port (NYSERDA Report 22-03^[304]), DC fast \$154,200 per stall (NREL 2023 charging network^[305]), replaced every 10 years (DOE EVSE costs 2015^[306]) **ESTIMATE**. Battery: 1, 2 and 5 MW at 2 and 4 hours (and 8 hours where useful),

never below 1 MW; the option with the best NPV over the term, no credits **GAIERGY VIEW**. Battery cost from (PNNL cost database 2024^[255]); O&M 4% of cost a year including augmentation that keeps rated capacity through the term, with no separate replacement (NREL ATB 2025^[195]; NREL/TP-6A40-93281^[217]); others also augment to nameplate over a 20 to 25 year life (Lazard LCOE+ 2025^[215]; PNNL-33283^[216]; Fluence Smart Service Plans^[222]); beyond 25 years **ESTIMATE**. Avoided service, transformer and switchgear: \$120 per kW (ESTIMATE: Gaiergy proxy from National Grid upstate New York upgrade costs, about \$600,000 per 5 MW (2026)). A battery cuts the grid service needed by 50% to 80% at most (NREL, battery-buffered fast charging^[293]). **Contract terms:** New York up to 35 years, capped at useful life (NY Energy Law 9-102, 9-103^[1]) (25 years base, 35 years second case); New Jersey 25 years, the battery's life, through a contracting path outside ESIP, which caps at 15 years (NJ P.L.2009 c.4; P.L.2012 c.55^[11]; NJ P.L.2012 c.55^[27]) **GAIERGY VIEW**; California no cap (Cal. Gov. Code 4217.10-.19^[12]), 25 years to match the federal ESPC maximum (42 USC 8287^[7]). NPV at each term's lease-purchase rate. DC fast price \$0.475 per kWh **ESTIMATE** (posted: NYPA \$0.47 (NYPA EVolve NY^[269]), Hoboken \$0.49 (City of Hoboken 2023^[270]), network averages higher (DCFC Tracker, EVgo (third party)^[271]); Level 2 \$0.27 NY (NYC DOT, Electric Vehicles^[268]), \$0.28 NJ and \$0.35 CA **ESTIMATE** (City of San Jose EV chargers^[275]). Charger fees \$500 per port and \$4,000 per stall a year plus 5% of sales **UNCONFIRMED** **ESTIMATE**.

Airport garage

Airport garage, New York, National Grid: 25-year contract

+\$6.68 million

NPV over 25 years, solar + battery + EV sales (C), no credits **ESTIMATE**

+\$1.31 million

NPV over 25 years, battery only (A), payback 8.6 years **ESTIMATE**

+\$8.55 million

NPV, managed chargers with no battery **ESTIMATE**



CONTRACT AND TARIFF

- Energy contract term 25 years (NY Energy Law 9-102, 9-103^[1]); lease-purchase matched to it at 5.82%: AAA municipal yield on Sept. 28, 2026 at the term (Piper Sandler, Sept. 28, 2026^[253]) plus 0.75% **ESTIMATE**
- Garage and chargers on the National Grid EV Phase-In Rate, SC-3 secondary: demand \$0 to \$11.72 per kW-month by load-factor tier, standard \$15.62 above a 25% load factor (National Grid EV Phase-In Rate Guide^[287])
- Supply about \$0.086 per kWh: S.C. 2ND Central zone stand-in for SC-3 (National Grid supply statement 181^[300]) **UNCONFIRMED**



BATTERY AND GRID SERVICE

- Battery with the best NPV over the term: 2 MW / 4 MWh **ESTIMATE**
- Grid service needed: 3,122 kW with no battery and no load management; 1,509 kW with the battery **ESTIMATE**
- Avoided service at \$120 per kW (ESTIMATE: Gaiergy proxy from National Grid upstate New York upgrade costs, about \$600,000 per 5 MW (2026))



VALUE OVER THE CONTRACT TERM, NO CREDITS

- A. Battery only: NPV +\$1.31 million; net cash +\$2.74 million; payback 8.6 years **ESTIMATE**
- B. Solar + battery: NPV -\$459,000; net cash -\$672,600; payback 16.1 years **ESTIMATE**
- C. + EV charging sales: NPV +\$6.68 million; net cash +\$13.81 million; payback 7.1 years **ESTIMATE**



WITH TAX CREDITS

- A with the battery credit: NPV +\$2.00 million **ESTIMATE**
- B with the solar credit: +\$129,700; with both credits: +\$827,200 **ESTIMATE**
- C with both credits: +\$7.96 million **ESTIMATE**
- Battery 34% and solar 25.5% by direct pay (26 USC 48E^[147]; 26 USC 45Y^[148]); tax-exempt financing cut (26 USC 45^[193]) **UNCONFIRMED**
- Existing garage, canopy at the deck membrane replacement: B NPV -\$934,000 **ESTIMATE**



MANAGED CHARGERS, NO BATTERY

- Load management alone cuts service to 2,634 kW **ESTIMATE**
- Charger business NPV over the term: +\$7.14 million unmanaged, +\$8.55 million managed **ESTIMATE**
- Managed chargers beat set-up C here; the battery's added edge is backup power and room to grow

GAIERGY VIEW

Airport garage, New York, National Grid: 35-year contract (second case)

+\$8.53 million

NPV over 35 years, solar + battery + EV sales (C), no credits **ESTIMATE**

+\$1.79 million

NPV over 35 years, battery only (A), payback 8.6 years **ESTIMATE**

+\$10.11 million

NPV, managed chargers with no battery **ESTIMATE**



CONTRACT AND TARIFF

- Energy contract term 35 years (NY Energy Law 9-102, 9-103^[1]); lease-purchase matched to it at 5.98%: AAA municipal yield on Sept. 28, 2026 at the term (Piper Sandler, Sept. 28, 2026^[253]) plus 0.75% **ESTIMATE**
- Garage and chargers on the National Grid EV Phase-In Rate, SC-3 secondary: demand \$0 to \$11.72 per kW-month by load-factor tier, standard \$15.62 above a 25% load factor (National Grid EV Phase-In Rate Guide^[287])
- Supply about \$0.086 per kWh: S.C. 2ND Central zone stand-in for SC-3 (National Grid supply statement 181^[300])

UNCONFIRMED



BATTERY AND GRID SERVICE

- Battery with the best NPV over the term: 2 MW / 4 MWh **ESTIMATE**
- Grid service needed: 3,122 kW with no battery and no load management; 1,509 kW with the battery **ESTIMATE**
- Avoided service at \$120 per kW (ESTIMATE: Gaiergy proxy from National Grid upstate New York upgrade costs, about \$600,000 per 5 MW (2026))



VALUE OVER THE CONTRACT TERM, NO CREDITS

- A. Battery only: NPV +\$1.79 million; net cash +\$4.97 million; payback 8.6 years **ESTIMATE**
- B. Solar + battery: NPV +\$76,600; net cash +\$763,900; payback 16.1 years **ESTIMATE**
- C. + EV charging sales: NPV +\$8.53 million; net cash +\$23.36 million; payback 7.1 years **ESTIMATE**



WITH TAX CREDITS

- A with the battery credit: NPV +\$2.49 million **ESTIMATE**
- B with the solar credit: +\$665,300; with both credits: +\$1.36 million **ESTIMATE**
- C with both credits: +\$9.82 million **ESTIMATE**
- Battery 34% and solar 25.5% by direct pay (26 USC 48E^[147]; 26 USC 45Y^[148]); tax-exempt financing cut (26 USC 45^[193]) **UNCONFIRMED**
- Existing garage, canopy at the deck membrane replacement: B NPV -\$398,400 **ESTIMATE**



MANAGED CHARGERS, NO BATTERY

- Load management alone cuts service to 2,634 kW **ESTIMATE**
- Charger business NPV over the term: +\$8.46 million unmanaged, +\$10.11 million managed **ESTIMATE**
- Managed chargers beat set-up C here; the battery's added edge is backup power and room to grow

GAIERGY VIEW

Airport garage, New Jersey, PSE&G: 25-year contract outside ESIP

+\$10.52 million

NPV over 25 years, solar + battery + EV sales (C), no credits **ESTIMATE**

-\$12,400

NPV over 25 years, battery only (A), payback 14.7 years **ESTIMATE**

+\$11.41 million

NPV, managed chargers with no battery **ESTIMATE**



CONTRACT AND TARIFF

- Energy contract term 25 years (the battery's life), through a contracting path outside ESIP; ESIP itself caps at 15 years (NJ P.L.2009 c.4; P.L.2012 c.55^[11]; NJ P.L.2012 c.55^[27]) **GAIERGY VIEW**; lease-purchase matched to it at 5.82%: AAA municipal yield on Sept. 28, 2026 at the term (Piper Sandler, Sept. 28, 2026^[253]) plus 0.75% **ESTIMATE**
- Rate Schedule GLP: demand \$4.4531 per kW-month all year plus \$15.3231 June to September (PSE&G tariff No. 17^[281]); energy about \$0.101 per kWh **ESTIMATE**
- SREC-II \$130 per MWh for 15 years on canopy output (NJ BPU ADI order, May 21, 2026^[301]) **ESTIMATE**; Level 2 incentive \$4,000 per port (NJDEP It Pay\$ to Plug In^[307]) **ESTIMATE**



BATTERY AND GRID SERVICE

- Battery with the best NPV over the term: 1 MW / 2 MWh **ESTIMATE**
- Grid service needed: 3,122 kW with no battery and no load management; 2,198 kW with the battery **ESTIMATE**
- Avoided service at \$120 per kW (ESTIMATE: Gaiergy proxy from National Grid upstate New York upgrade costs, about \$600,000 per 5 MW (2026))



VALUE OVER THE CONTRACT TERM, NO CREDITS

- A. Battery only: NPV -\$12,400; net cash +\$34,700; payback 14.7 years **ESTIMATE**
- B. Solar + battery: NPV -\$19,500; net cash -\$543,500; payback 11.6 years **ESTIMATE**
- C. + EV charging sales: NPV +\$10.52 million; net cash +\$20.74 million; payback 4.6 years **ESTIMATE**



WITH TAX CREDITS

- A with the battery credit: NPV +\$341,500 **ESTIMATE**
- B with the solar credit: +\$569,200; with both credits: +\$923,100 **ESTIMATE**
- C with both credits: +\$11.46 million **ESTIMATE**
- Battery 34% and solar 25.5% by direct pay (26 USC 48E^[147]; 26 USC 45Y^[148]); tax-exempt financing cut (26 USC 45^[193]) **UNCONFIRMED**
- Existing garage, canopy at the deck membrane replacement: B NPV -\$494,500 **ESTIMATE**



MANAGED CHARGERS, NO BATTERY

- Load management alone cuts service to 2,634 kW **ESTIMATE**
- Charger business NPV over the term: +\$10.54 million unmanaged, +\$11.41 million managed **ESTIMATE**
- Managed chargers beat set-up C here; the battery's added edge is backup power and room to grow **GAIERGY VIEW**

Airport garage, California, PG&E: 25-year contract

+\$9.36 million

NPV over 25 years, solar + battery + EV sales (C), no credits **ESTIMATE**

+\$953,300

NPV over 25 years, battery only (A), payback 8.3 years **ESTIMATE**

+\$8.55 million

NPV, managed chargers with no battery **ESTIMATE**



CONTRACT AND TARIFF

- Energy contract term 25 years (Cal. Gov. Code 4217.10-.19^[12]; 42 USC 8287^[7]); lease-purchase matched to it at 5.82%: AAA municipal yield on Sept. 28, 2026 at the term (Piper Sandler, Sept. 28, 2026^[253]) plus 0.75% **ESTIMATE**
- Chargers, canopy and battery on PG&E BEV-2-S: \$95.56 per 50 kW block a month instead of a demand charge; energy \$0.13327 to \$0.36977 per kWh (PG&E Schedule BEV^[290])
- General garage lighting stays on a separate meter: BEV allows only loads dedicated to the charging site (PG&E Schedule BEV^[290])



BATTERY AND GRID SERVICE

- Battery with the best NPV over the term: 1 MW / 4 MWh **ESTIMATE**
- Grid service needed: 3,122 kW with no battery and no load management; 2,198 to 2,295 kW with the battery **ESTIMATE**
- Avoided service at \$120 per kW (ESTIMATE: Gaiergy proxy from National Grid upstate New York upgrade costs, about \$600,000 per 5 MW (2026))



VALUE OVER THE CONTRACT TERM, NO CREDITS

- A. Battery only: NPV +\$953,300; net cash +\$2.01 million; payback 8.3 years **ESTIMATE**
- B. Solar + battery: NPV +\$935,000; net cash +\$2.08 million; payback 10.9 years **ESTIMATE**
- C. + EV charging sales: NPV +\$9.36 million; net cash +\$19.17 million; payback 5.9 years **ESTIMATE**



WITH TAX CREDITS

- A with the battery credit: NPV +\$1.58 million **ESTIMATE**
- B with the solar credit: +\$1.52 million; with both credits: +\$2.15 million **ESTIMATE**
- C with both credits: +\$10.58 million **ESTIMATE**
- Battery 34% and solar 25.5% by direct pay (26 USC 48E^[147]; 26 USC 45Y^[148]); tax-exempt financing cut (26 USC 45^[193]) **UNCONFIRMED**
- Existing garage, canopy at the deck membrane replacement: B NPV +\$460,000 **ESTIMATE**



MANAGED CHARGERS, NO BATTERY

- Load management alone cuts service to 2,634 kW **ESTIMATE**
- Charger business NPV over the term: +\$8.43 million unmanaged, +\$8.55 million managed **ESTIMATE**
- Set-up C beats managed chargers here **GAIERGY VIEW**

Airport garage pays over the contract term; small garage does not

ESTIMATE

Value to the public owner over each energy contract term (NPV at the lease rate), no tax credits; simple payback second. Battery chosen for the best NPV, never below 1 MW.

■ A Battery only ■ B Solar + battery ■ B with both credits ■ C Solar + battery + EV sales

Airport garage, 1,000 stalls: 200 Level 2 ports, 10 DC fast stalls, 3 shifts a day

New York, 25-year contract: battery 2 MW / 2 h, service 1,509 kW



New York, 35-year contract: battery 2 MW / 2 h, service 1,509 kW



New Jersey, 25-year contract (outside ESIP): battery 1 MW / 2 h, service 2,198 kW



California, 25-year contract: battery 1 MW / 4 h, service 2,198 to 2,295 kW



-\$2.00M \$0 \$2.00M \$4.00M \$6.00M \$8.00M \$10.0M

Municipal garage, 200 stalls: 40 Level 2 ports, 2 DC fast stalls (same dollar scale)

New York, 25-year contract: 1 MW / 2 h



New York, 35-year contract: 1 MW / 2 h



New Jersey, 25-year contract (outside ESIP): 1 MW / 2 h



California, 25-year contract: 1 MW / 2 h



Why the small garage loses: EV rates already remove most of the demand charge a battery would cut. PG&E's BEV rate replaces it with a subscription (about \$17,000 a year here); National Grid's EV Phase-In Rate charges half the standard rate at this load. In New Jersey (GLP) the 728 kW peak is too small to pay for a 1 MW battery.

ESTIMATE. Gaiergy garage model, Oct. 2026. NPV at each term's lease-purchase rate. Payback = net installed cost / year-1 savings. Avoided service, transformer and switchgear \$120/kW; ESTIMATE: Gaiergy proxy from National Grid upstate New York upgrade costs, about \$600,000 per 5 MW (2026). Battery cost PNNL Energy Storage Cost and Performance Database v2024; O&M 4% of cost per year including augmentation that keeps rated capacity through the term (NREL ATB 2025). Level 2 at most 11.5 kW per car (Tesla support page). Tariffs: National Grid EV Phase-In Rate (July 2026), PSE&G GLP (Oct. 1, 2026), PG&E BEV-2-S (Mar. 1, 2026). Both credits: battery 34% and solar 25.5% by direct pay, 26 USC 48E (financing cut UNCONFIRMED). Contract terms: NY Energy Law 9-103 (up to 35 years, capped at useful life); New Jersey 25 years, the battery's life, through a contracting path outside ESIP (ESIP, P.L.2012 c.55, caps at 15 years); CA Gov. Code 4217.10 to 4217.19 (no cap; 25 years matches the federal ESPP maximum, 42 U.S.C. 8287). Lease-purchase rate matched to each term: AAA BVAL on Sept. 28, 2026 (20-year 4.91%, 30-year 5.23%) plus 0.75% ESTIMATE. Sources accessed Oct. 2 to 4, 2026.

Figure 43. Value over the energy contract term, airport garage first, municipal garage second. Gaiergy graphic from the Gaiergy garage model. ESTIMATE

Airport garage: managed chargers with no battery vs. set-up C

ESTIMATE

Value over each energy contract term (NPV at the lease rate), no tax credits. The kW figure after each value is the grid service needed.



Where managed chargers come out ahead, the battery's added edge is backup power and room to grow.

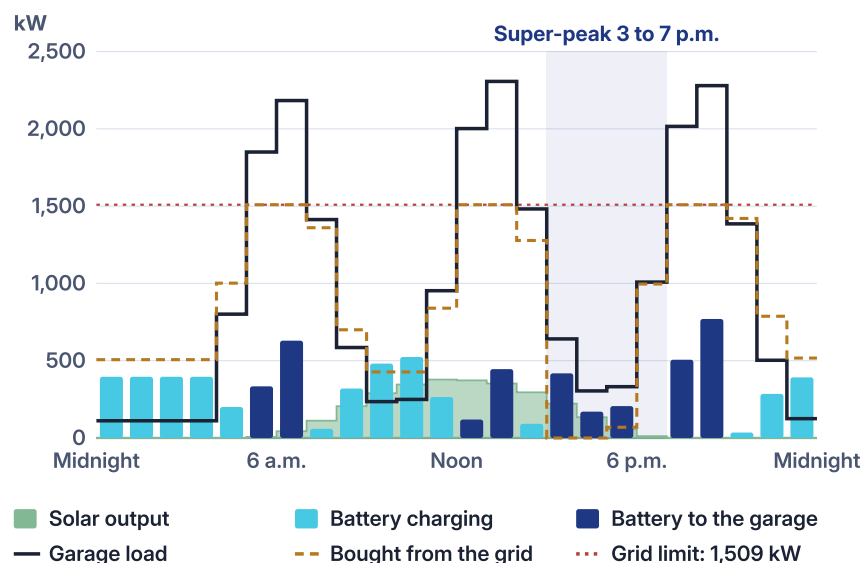
ESTIMATE. Gaiergy garage model, Oct. 2026. Managed chargers: charger business alone (revenue less energy, fees and charger replacement every 10 years) with load management that spreads Level 2 charging over each 8-hour shift; no battery, no solar. Set-up C: the best-NPV battery with the solar canopy plus the same chargers, unmanaged. Service in kW = grid connection needed. Avoided service \$120/kW: ESTIMATE: Gaiergy proxy from National Grid upstate New York upgrade costs, about \$600,000 per 5 MW (2026). Contract terms: NY Energy Law 9-103 (up to 35 years, capped at useful life); New Jersey 25 years, the battery's life, through a contracting path outside ESIP (ESIP, P.L.2012 c.55, caps at 15 years); CA Gov. Code 4217.10 to 4217.19 (no cap; 25 years matches the federal ESPC maximum, 42 U.S.C. 8287). Lease-purchase rate matched to each term: AAA BVAL on Sept. 28, 2026 (20-year 4.91%, 30-year 5.23%) plus 0.75% ESTIMATE.

Figure 44. Airport garage: managed chargers with no battery versus solar + battery + EV sales. Gaiergy graphic from the Gaiergy garage model. ESTIMATE

Airport garage: the battery holds the shift-change peaks under the grid limit

ESTIMATE

New York sample airport garage, one average day: 950 kWdc solar canopy and a 2 MW / 4 MWh battery (set-up B).



What the day shows

Grid service needed

3,122 kW without
1,509 kW with the battery

Shift changes

4:00, 11:00, 18:00:
200 Level 2 ports, 30 kWh each

DC fast

10 stalls, 7 at full
150 kW at the monthly peak

Solar canopy

1.03 million kWh/yr,
all used on site

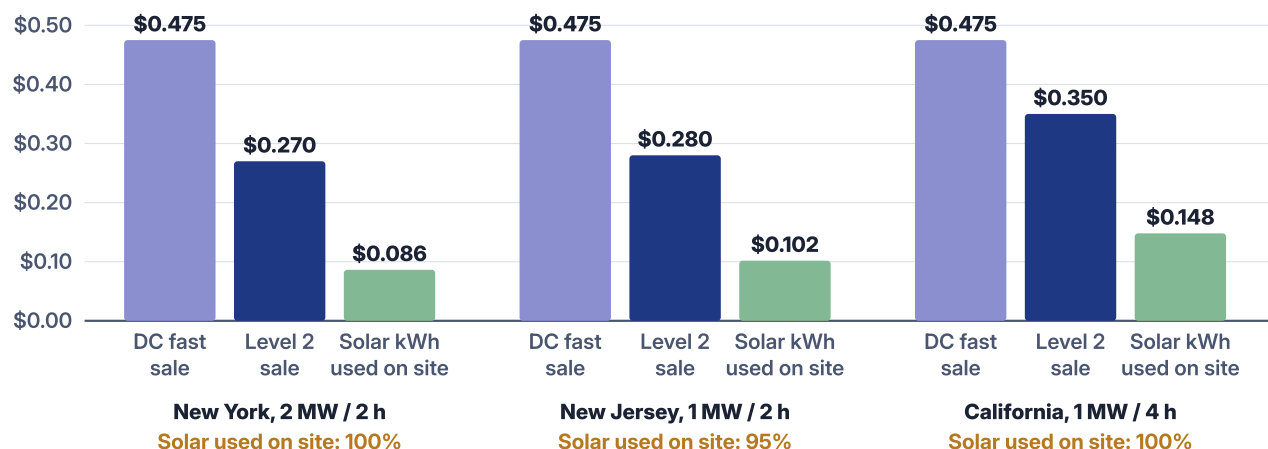
Average day x 365, hourly. DC fast power above its hourly average is billed but not drawn here. ESTIMATE. Gaiergy garage model, Oct. 2026. Solar: NLR PVWatts v8 (Syracuse), canopy output -5% (MA DOER / SEA 2024). National Grid EV Phase-In Rate super-peak 3 to 7 p.m. Battery 90% usable, 85% round trip (Lazard 2025; NREL ATB 2024). Level 2 at most 11.5 kW per car (Tesla support page). Sources accessed Oct. 2 to 4, 2026.

Figure 45. Airport garage, New York, one average day: the battery holds shift-change peaks under the grid limit. Gaiergy graphic from the Gaiergy garage model. ESTIMATE

A kWh sold through a charger earns 2.4 to 5.5 times what a solar kWh saves

ESTIMATE

Airport garage, set-up B battery for each state. Dollars per kWh. Bars to scale.



The canopy covers only part of the daytime charging load, so almost every solar kWh is used on site and saves only the grid energy it replaces. The charger sells every kWh, from the grid or the sun, at the posted price.

ESTIMATE. Gaiergy garage model, Oct. 2026. Solar kWh used on site = bill saved by adding the canopy (same battery) / solar kWh not exported. DC fast \$0.475 = middle of \$0.45 to \$0.50, checked against posted prices (NYPA Evolve NY \$0.47, NYC DOT \$0.39, City of Hoboken \$0.49). Level 2: NYC DOT municipal garages \$0.27; NJ \$0.28 and CA \$0.35 ESTIMATE from posted network and city prices. Tariffs: National Grid EV Phase-In Rate, PSE&G GLP, PG&E BEV-2-S. Solar: NLR PVWatts v8. Sources accessed Oct. 3 and 4, 2026.

Figure 46. A charged kWh sells for 2.4 to 5.5 times what a solar kWh saves. Gaiergy graphic from the Gaiergy garage model. ESTIMATE

Municipal garage

Municipal garage: 200 stalls, all three states



THE GARAGE

- 200 stalls on 4 levels; 40 Level 2 ports at 19.2 kW, one 50 kWh session a day each; 2 DC fast stalls at 276 kWh a day (EVgo Q2 2026 results^[292]) ESTIMATE
- Peak 728 kW with no battery; 520 kW with load management ESTIMATE
- Battery 1 MW / 2 MWh in every case, the smallest allowed; service needed 148 to 168 kW ESTIMATE



NPV OVER THE CONTRACT TERM, NO CREDITS (PAYBACK)

- **New York, 25 years:** A –\$681,500 (41.6 years); B –\$1.10 million (43.0 years); C –\$827,500 (18.8 years)
ESTIMATE
- **New York, 35 years:** A –\$656,800 (41.6 years); B –\$1.06 million (43.0 years); C –\$716,400 (18.8 years)
ESTIMATE
- **New Jersey, 25 years: a contracting path outside ESIP (ESIP caps at 15):** A –\$766,800 (58.3 years); B –\$717,200 (21.0 years); C –\$278,500 (13.1 years) **ESTIMATE**
- **California, 25 years:** A –\$1.54 million (no payback); B –\$1.40 million (51.0 years); C –\$199,000 (12.8 years)
ESTIMATE



WHY IT LOSES

- EV rates already remove most of the demand charge a battery would cut: PG&E's BEV rate replaces it with a subscription, about \$17,000 a year here (PG&E Schedule BEV^[290]) **ESTIMATE**; National Grid's EV Phase-In Rate charges half the standard rate at this load factor (National Grid EV Phase-In Rate Guide^[287])
- In New Jersey (GLP) the 728 kW peak is too small to pay for a 1 MW battery **ESTIMATE**
- With both credits only California C is about break-even: +\$302,000 **ESTIMATE**

13.5 Real projects



Piscataway Township, New Jersey

ESIP: solar, battery, microgrid and 28 public EV chargers

\$24.9 million program

- 2.9 MW of solar on eight buildings, battery storage, a microgrid and 28 new EV chargers; about five days of backup power (Piscataway Township^[308])
- \$13.2 million from incentives, grants, rebates and the ITC; the rest through an energy savings performance contract; projected \$19.2 million of savings over 20 years (Piscataway Township^[308])



Montgomery County, Maryland: Brookville bus depot

Energy as a service

25 years, no upfront payment

- Solar canopies, a 4.3 MWh battery, 2 MW of natural gas generation and over 2 MW of charging (FHWA, Montgomery microgrid depot^[309])
- First-year energy charge 12.3 cents per kWh, increases capped at 1.8% a year (Montgomery County Council 2021^[15])



New York City DCAS solar carports

Off-grid solar and battery Level 2 chargers

\$74,180.06 a unit

- 71 units bought off a federal GSA contract for \$5,255,282.26 in 2022 (City Record 20221006103^[310]); 110 in operation by June 2023 (DCAS testimony 2023^[311])
- First-generation units had batteries at ground level, and some flooded in Hurricane Ida (NYC Fleet Newsletter 418^[312])



Martha's Vineyard Transit Authority, Massachusetts

Bus depot microgrid

\$4 million **VENDOR**

- 700 kW of solar on carports, a 1.5 MWh battery, a backup diesel generator and 16 charging stations (Arup, Martha's Vineyard (designer)^[313]; Enel X, Martha's Vineyard (vendor)^[314])
- Half from a partnership with the developer, half from FTA and state grants; 20-year PPA with 30% savings
VENDOR (Enel X, Martha's Vineyard (vendor)^[314])



Santa Clara, California: Tasman Parking Garage

City garage with public chargers

\$393,000 state grant

- 370 kW of solar on a six-story garage, a battery to cut peak demand, 48 Level 2 chargers and one fast charger (T&D World 2016, Santa Clara^[315])
- Driver fees were expected to cover operating costs; the solar feeds the city utility's grid, not the chargers directly (T&D World 2016, Santa Clara^[315])

PRESS ONLY

LESSON

None of these projects publishes measured EV charging revenue (Gaiergy review, October 2026). The working proof that solar charges a battery and the battery feeds the chargers comes from fleet depots, which save on fuel and demand charges rather than sell charging. A public garage that sells charging would be among the first to publish the numbers.

Checklist and contract clauses

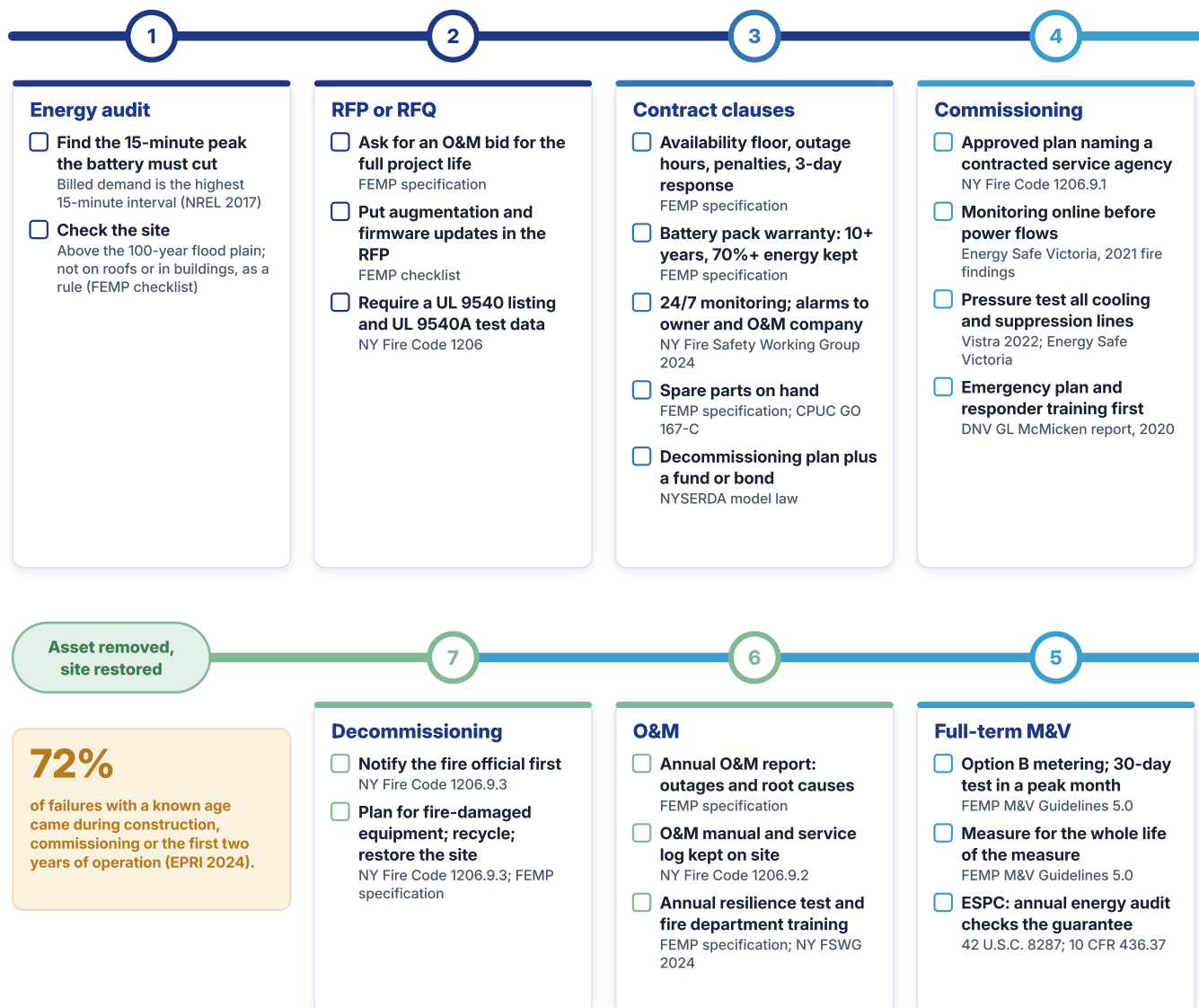
THE ANSWER

Twelve steps take a battery from first question to recycling. **Twelve clauses carry the O&M half into the contract**, so that it is priced, named and enforceable for the full term.

The procurement path for a public battery

Seven stations from audit to removal. Tick each box before you move on.

Selection: GAIERGY VIEW; items sourced



Gaiergy illustration. Sources (accessed Oct. 2, 2026): NREL/BR-6A20-68963 (2017); DOE FEMP BESS Procurement Checklist (Feb. 2023) and Li-ion BESS Technical Specifications (2025 template); FEMP M&V Guidelines 5.0 (Sept. 2024); 42 U.S.C. 8287(a)(2)(A); 10 CFR 436.37; 2020 Fire Code of NYS Sec. 1206 and NYSERDA Model Law (NYSERDA Guidebook, Nov. 2024); NY FSWG Fire Code Recommendations (July 2024); CPUC GO 167-C (2025); Energy Safe Victoria, Victorian Big Battery findings; Vistra Moss Landing findings (Jan. 2022); DNV GL McMicken report (2020); EPRI, TWACE and PNNL root cause paper (May 2024).

Figure 47. The path from first question to end of life. Each gate matches a step below. Gaiergy graphic.

The 12 steps

1 Name the job

Peak cut, peak program, backup, or a mix. Only the first two pay (Section 4).

2 Check the law

Your state's term limit and whether storage, demand or revenue appear in it (Section 6).

3 Pick the path

ESPC, UESC route, or one of the other paths, by owner type (Sections 2 and 5).

4 Get interval data

FEMP measures battery savings from interval demand billing, charge and discharge data (FEMP M&V Guidelines 5.0^[48]).

5 Investment grade audit

Bundle the battery with fast-payback measures if it cannot pay alone (FEMP ESPC scope FAQ 2022^[8]).

6 Meet the fire department early

Siting, access, setbacks and the emergency plan (Sections 3 and 10).

7 Test the tax gates

Domestic content, foreign content and bonds, before design is frozen (Section 9).

8 Write O&M into the request for proposals

FEMP: include augmentation and firmware updates in the request (FEMP BESS procurement checklist 2023^[43]).

9 Commission with monitoring live

Verify monitoring before power flows and pressure test cooling and suppression (Energy Safe Victoria^[201]; Vistra 2022 findings^[209]).

10 Verify in a peak month

FEMP: a 30-day check in a month where peak demand is typically set, then continuous measurement (FEMP M&V Guidelines 5.0^[48]).

11 Run and report

Annual energy audit under an ESPC, annual O&M report, annual resilience test (42 USC 8287^[7]; FEMP Li-ion BESS spec 2025^[42]).

12 Augment, then decommission

Top up capacity on plan; remove and recycle under a funded plan (Section 10).

The 12 clauses

Offered as recommendations to consider for any battery contract, whatever the path.

01



Full-term M&V

FEMP recommends measuring key battery data and continuous measurement for the life of the measure (FEMP M&V Guidelines 5.0^[48]). Only 28% of ESCOs typically deliver full-term M&V in public projects (LBNL ESCO report 2026^[109]).

02



Availability guarantee

Define response, minimum availability, allowed maintenance hours and penalties (FEMP Li-ion BESS spec 2025^[42]). One vendor offers up to 99% uptime **VENDOR** (Fluence Smart Service Plans^[222]).

03



Capacity and augmentation

Hold capacity above a set floor for the term, or a fixed number of top-ups (Fluence 10-K FY2024^[221]). Put augmentation in the RFP (FEMP BESS procurement checklist 2023^[43]).

04



24/7 monitoring and alarm escalation

A staffed operations center with critical alarms sent at once to the owner and O&M company (NY FSWG recommendations 2024^[226]). The Elkhorn alarms went two days without action (EPRI 2024 root cause paper^[2]).

05



Emergency plan and fire department training

Site plan with an entry procedure, shared with responders, trained every year (NY FSWG recommendations 2024^[226]; DNV GL 2020, McMicken^[197]).

06



Spare parts and response time

Spares on hand to avoid downtime (CPUC GO 167-C^[45]). A named response time, such as FEMP's 3 days (FEMP Li-ion BESS spec 2025^[42]).

07



Firmware, cybersecurity and dispatch updates

Current firmware, a separate network connection, and dispatch updates when tariffs change (FEMP Li-ion BESS spec 2025^[42]).

08



Warranty kept alive

Makers may require O&M for the life of the asset to keep the warranty (FEMP Li-ion BESS spec 2025^[42]). Tie the O&M scope to the warranty terms.

09



Reserve account

Fund future augmentation and refresh. In a DOE contract, reserve funds cannot offset a savings shortfall (DOE IDIQ ESPC contract 2023^[75]).

10



Annual O&M report

Outages with root cause summaries, repairs and safety incidents (FEMP Li-ion BESS spec 2025^[42]).

11



Root cause disclosure

New York's working group wants makers to disclose root cause reports, including maintenance logs and monitoring data (NY FSWG recommendations 2024^[226]).

12



End-of-life plan and bond

A decommissioning plan from day one and a fund or bond for the life of the facility (NYSERDA BESS Guidebook 2024^[41]).

How Gaiergy helps you build your own battery energy savings contract

THE ANSWER

A city, county, state, school, authority, industrial development agency or nonprofit can set up its own energy savings contract so that a utility-grade battery reinforces its energy security. **Gaiergy Corp works for the owner:** we size and specify the battery, act as the owner's representative, bring qualified lenders, write the fire, maintenance and oversight requirements, and manage the battery through to replacement.

15.1 Energy security comes first

A battery protects a critical building only if it is designed to run when the grid is down. FEMA's planning guide counts hospitals, fire, police and ambulance stations, designated shelters and emergency operations and communications centers as critical facilities (FEMA P-1019^[316]). For fuel-backed emergency power, FEMA notes that NFPA 110 calls for on-site fuel for 5 minutes to 48 hours depending on use, and 96 hours for critical facilities in high-seismic areas (FEMA P-1019^[316]).



A grid-tied battery stops in an outage

New York's interconnection rules say a generator may run during a utility outage *"only with an open tie to the utility. Islanding will not be permitted"* (NY SIR 2026^[265]). So backup needs an automatic switch that opens the utility tie, inverters that can form their own grid, and a critical-load panel **GAIERGY VIEW**.



Hours, not weeks, on its own

The New Jersey utility board found that renewables plus storage alone could not yet give critical facilities *"the level and length of resilience"* they need, and allowed fossil-fueled backup in its town center microgrids (NJ BPU TCDER Phase II order^[267]). A battery is usually sized for the critical load and paired with solar or a generator **GAIERGY VIEW**.



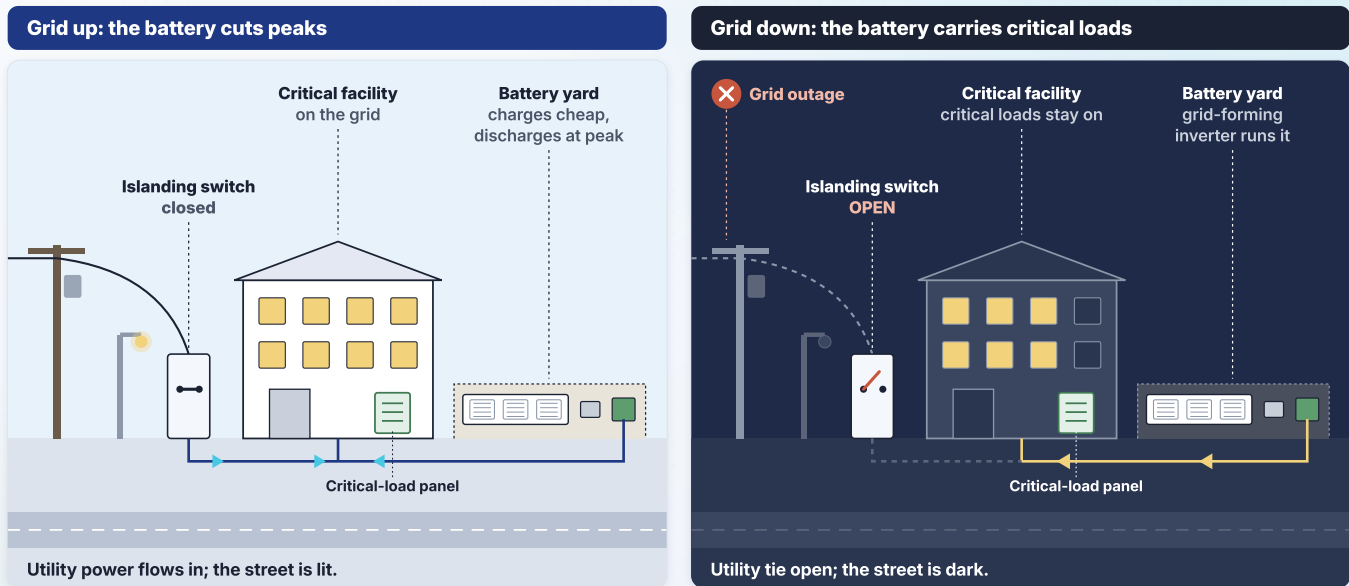
A battery backs up the backup

NREL slides on resilience note batteries can *"Extend limited fuel supply"*, and cite a study that poorly maintained diesel generators have *"just a 50% probability of lasting 48 hours"* (NREL resilience slides 2021^[263]).



Figure 48. When the grid goes down, a battery designed to island keeps the critical building running. Illustration, Gaiergy.

Grid up, the battery saves money; grid down, it keeps the lights on



New York rule

A generator or battery may run during a utility outage "only with an open tie to the utility"; islanding on utility circuits is not permitted.

NY Standardized Interconnection Requirements, effective Feb. 9, 2026, pp. 26-29

So the design needs (Gaiergy view)

- ✓ An islanding switch that opens the utility tie
- ✓ A grid-forming inverter on the battery
- ✓ A critical-load panel for the loads that must stay on

Sources: NY PSC, Standardized Interconnection Requirements (effective 2026-02-09), pp. 26-29; NJ BPU Order, Town Center DER Microgrid Phase II (2021-03-03); NREL, Battery Storage for Resilience (2021). Accessed 2026-10-03. Schematic, not to scale. Battery set: enclosure, control cabinet and pad-mount transformer on one axis.

Figure 49. Energy security, the same building on two days: with the grid up, the battery cuts peaks; with the grid down, the islanding switch opens and the battery carries the critical loads. Gaiergy graphic based on the New York interconnection rules (NY SIR 2026^[265]).

What utility-grade means here

The US Energy Information Administration (EIA) says "Utility-scale systems have at least one megawatt of power capacity" (EIA Today in Energy 41813^[46]). Gaiergy uses **utility-grade** for a system of about 1 MW or more that is containerized and listed to UL 9540, reviewed by the utility for protection, monitored and controlled

remotely, fed through its own transformer, and covered by a long-term O&M contract GAIERGY VIEW. Interconnection paths differ by size:

New York

State interconnection rules cover systems of 5 MW or less on distribution, with separate steps above 50 kW and a separate storage application (NY SIR 2026^[265]). Larger projects go to the state grid operator's process.

New Jersey

Level 2 review covers certified facilities of 2 MW or less (N.J.A.C. 14:8-5.5^[317]). Whether storage now goes to Level 3 after 2025 amendments is UNCONFIRMED.

California

Interconnection runs under the utilities' Rule 21. Which Rule 21 review track a given battery falls into is UNCONFIRMED; ask the utility at the pre-application stage.

15.2 Six services, in plain terms

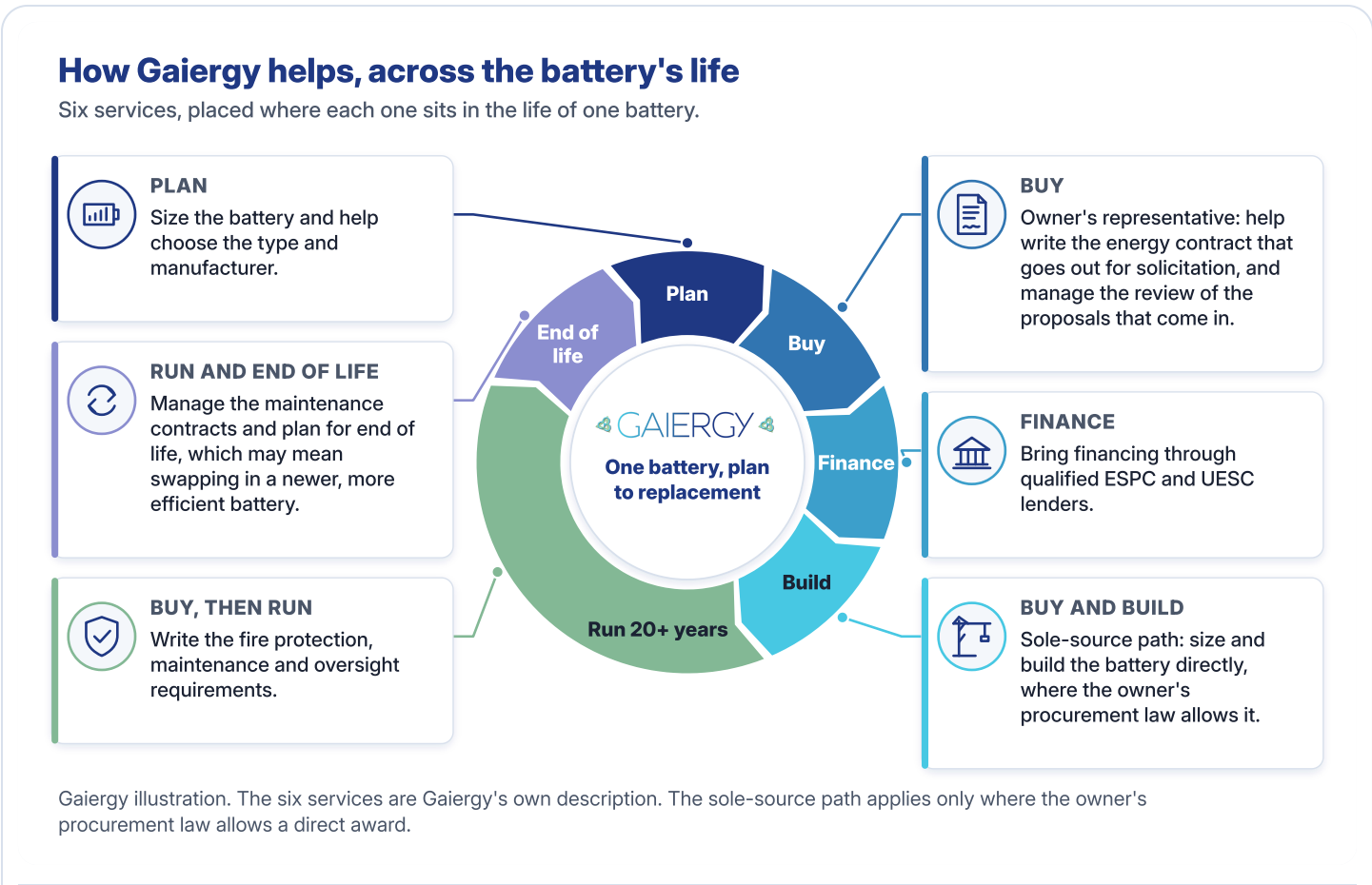


Figure 50. How Gaiergy helps across the battery's life: six services placed from plan, buy and finance to build, run and end of life. Gaiergy graphic.

01



Size the battery and help choose the type and maker

- Size from your interval data, tariff and critical loads
- Compare battery types and manufacturers on safety listing, warranty and service

02



Act as your owner's representative

- Help craft the energy contract that goes out for solicitation
- Manage the review of the proposals that come in
- Stay through construction, commissioning and M&V

03



Size and build it directly, where the law allows

- If you want to move straight to sole sourcing, and your law permits it, Gaiergy can size and build the battery itself
- On a project Gaiergy designs and builds under a sole-source award, the owner should hire a separate owner's representative
- See the compete or sole source test in 15.5

04



Bring financing to the table

- Through qualified ESPC and UESC lenders
- Lease-purchase, tax-exempt lease or certificate structures that fit your law (15.7)

05



Write the fire protection, maintenance and oversight requirements

- Fire code, emergency plan and responder training
- Monitoring, availability, augmentation and reporting (Sections 10 and 14)

06

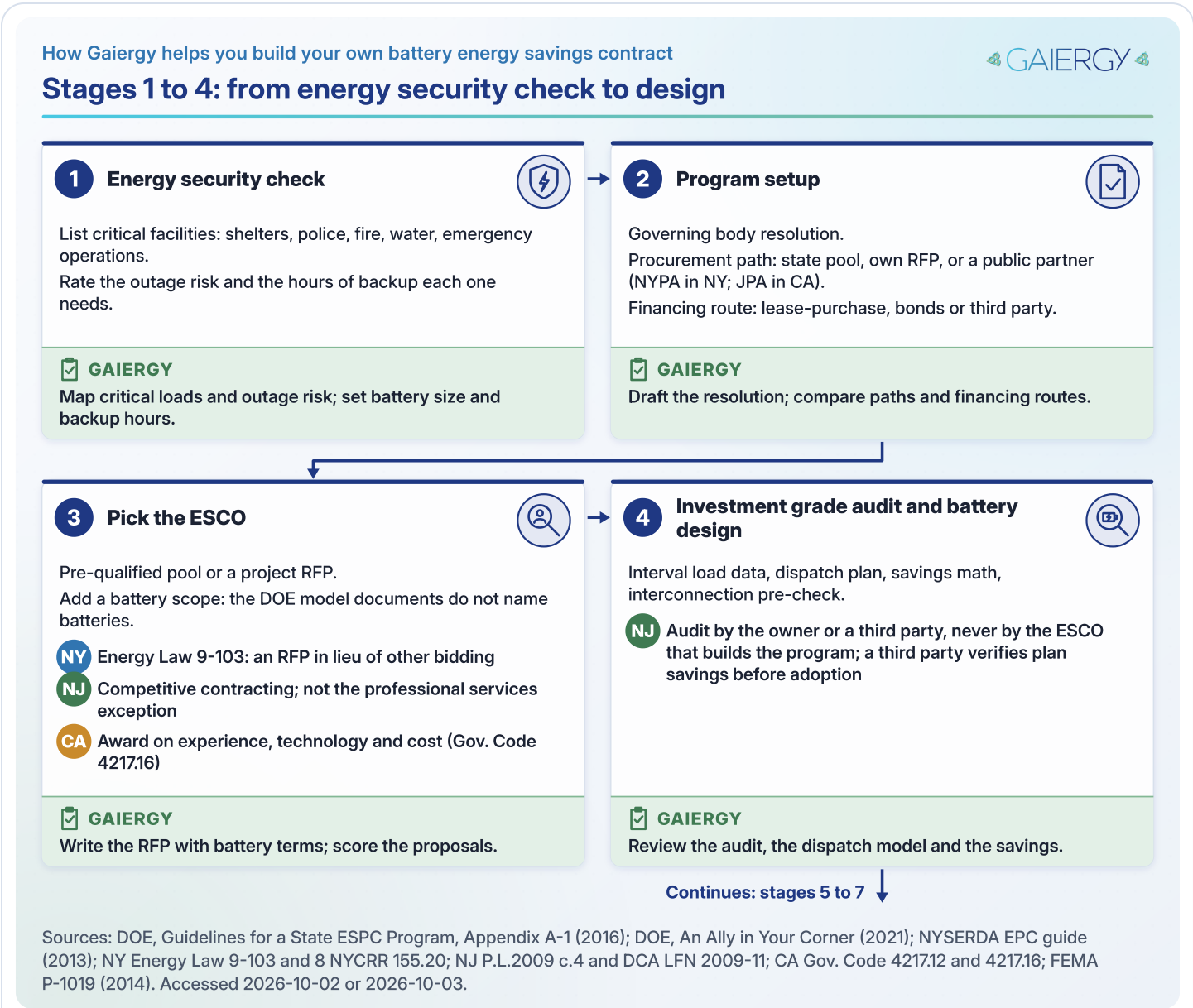


Manage maintenance and plan the end of life

- Manage the maintenance contracts for the full term
- Plan removal at end of life, which may simply mean replacing the battery with a better one (15.9)

15.3 How the program runs

Gaiergy runs the program in seven stages: an energy security check first, then the six program steps in Section 5, which are the same in every state. The approvals differ (DOE ESPC toolkit App. A^[65]; NJ DCA LFN 2009-11^[67]; Cal. Gov. Code 4217.10-.19^[12]; NYSERDA EPC guide 2013^[66]).



Stages 5 to 7: contract, build and 20+ years of operation



Sources: DOE, Guidelines for a State ESPC Program, Appendix A-1 (2016); DOE, An Ally in Your Corner (2021); NYSEDA EPC guide (2013); NY Energy Law 9-103 and 8 NYCRR 155.20; NJ P.L.2009 c.4 and DCA LFN 2009-11; CA Gov. Code 4217.12 and 4217.16; FEMA P-1019 (2014). Accessed 2026-10-02 or 2026-10-03.

Figure 52. How the program runs, stages 5 to 7: contract and financing, build, and 20 or more years of operation. Gaiergy graphic based on DOE, NYSEDA, New Jersey and California sources (DOE ESPC toolkit App. A^[65]; NYSEDA EPC guide 2013^[66]; NJ DCA LFN 2009-11^[67]; Cal. Gov. Code 4217.10-.19^[12]; FEMA P-1019^[316]; DOE 2021, owner's representatives^[318]).

New York

- **Approves:** the governing board; schools also need the Education Department (NY Energy Law 9-102, 9-103^[1]; 8 NYCRR 155.20^[19])
- **Verifies:** the contract M&V; the Comptroller audits after the fact (NY Comptroller 2015-MR-1^[319])
- **Pools:** no current statewide local pool found; NYPA runs its own competition (NY PAL 1005(17)^[16])

New Jersey

- **Approves:** the governing body adopts the plan after third-party verification (NJ P.L.2012 c.55^[27])
- **Verifies:** prequalified third parties at audit, plan and guarantee (NJ P.L.2012 c.55^[27])
- **Pools:** county improvement authorities or the state economic development authority can carry the lease (NJ DCA LFN 2009-11^[67])

California

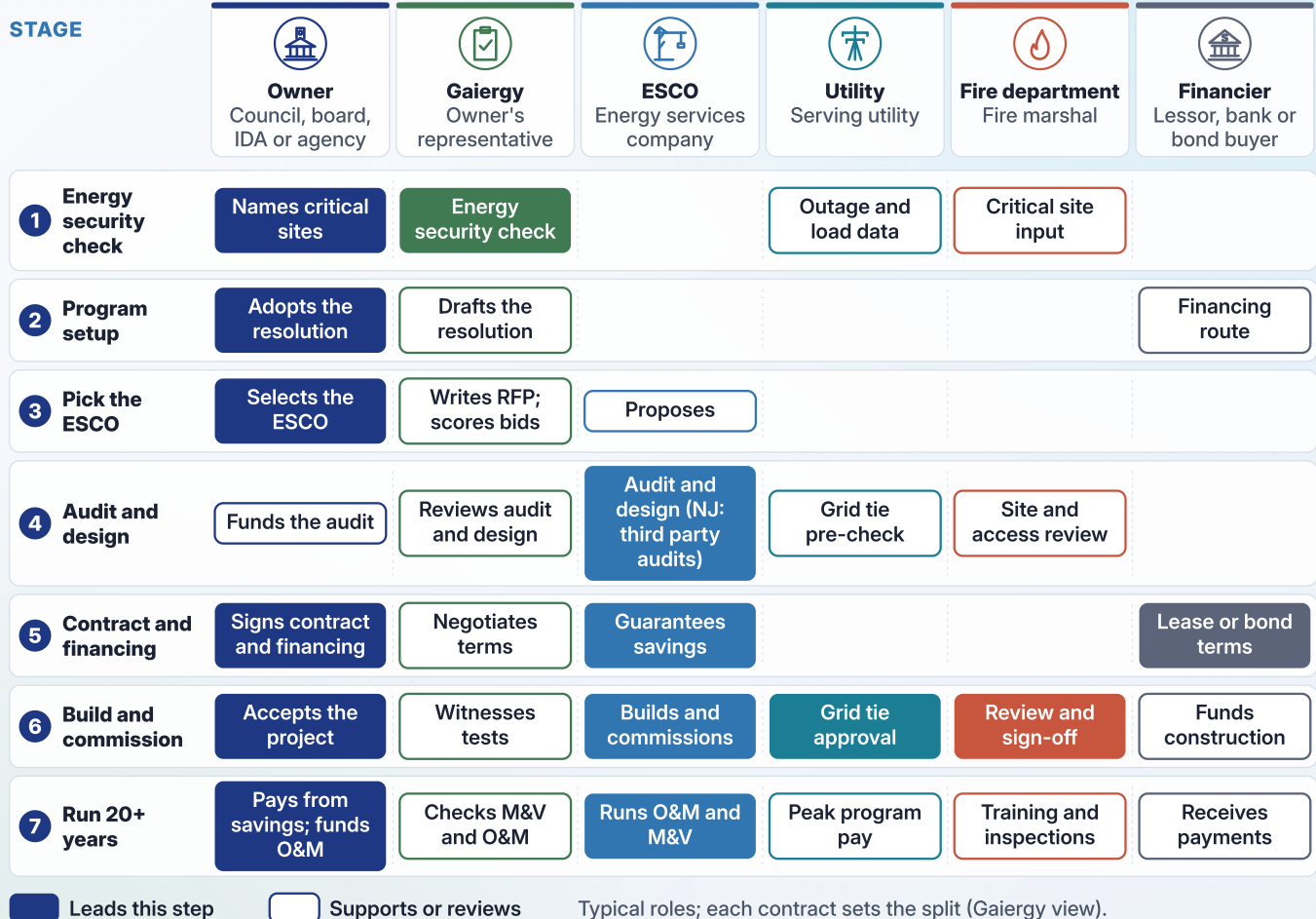
- **Approves:** the governing body, with findings at a noticed public hearing (Cal. Gov. Code 4217.10-.19^[12])
- **Verifies:** per contract
- **Pools:** qualified ESCO pools under Public Utilities Code 388; joint powers authorities (Cal. Pub. Util. Code 388^[114]; Cal. Gov. Code 6502^[115])

Who does what in a battery energy savings contract



Six players, seven stages

STAGE



Sources: DOE, Guidelines for a State ESPC Program, Appendix A-1 and B-3 (2016); NYSEDA EPC guide (2013); NJ DCA LFN 2009-11; NY Standardized Interconnection Requirements (2026). Accessed 2026-10-03.

Figure 53. Who does what in a battery energy savings contract: six players across seven stages; the owner's representative is in every step. Gaiergy graphic.

15.4 Who leads: including industrial development agencies

Any owner type in Section 2 can lead. Industrial development agencies (IDAs) add tools that suit a privately owned battery on or next to public land:



What a New York IDA can assist

A project “may include or mean ... a renewable energy project” (NY GML 854^[31]), which points to Real Property Tax Law 487 equipment, including “various types of batteries” (NY RPTL 487^[32]).



Its powers

Make contracts and leases, own and lease projects, issue bonds, sign payment-in-lieu-of-tax agreements and hire consultants (NY GML 858^[33]). IDA property pays no taxes; bonds are tax-exempt (NY GML 874^[34]).



Its steps

For assistance over \$100,000: a resolution, notice to each taxing jurisdiction, a public hearing with at least ten days' notice, a written cost-benefit analysis and a standard project agreement (NY GML 859-a^[320]).



In practice

New York City's IDA closed 14 battery projects in fiscal 2025, nearly 100 MW (NYCIDA FY2025^[35]). One 5 MW / 20 MWh project received a sales tax exemption capped at \$1,198,723 through a straight lease (NYCIDA resolution, Brigis 1B^[321]).

GAIERGY VIEW

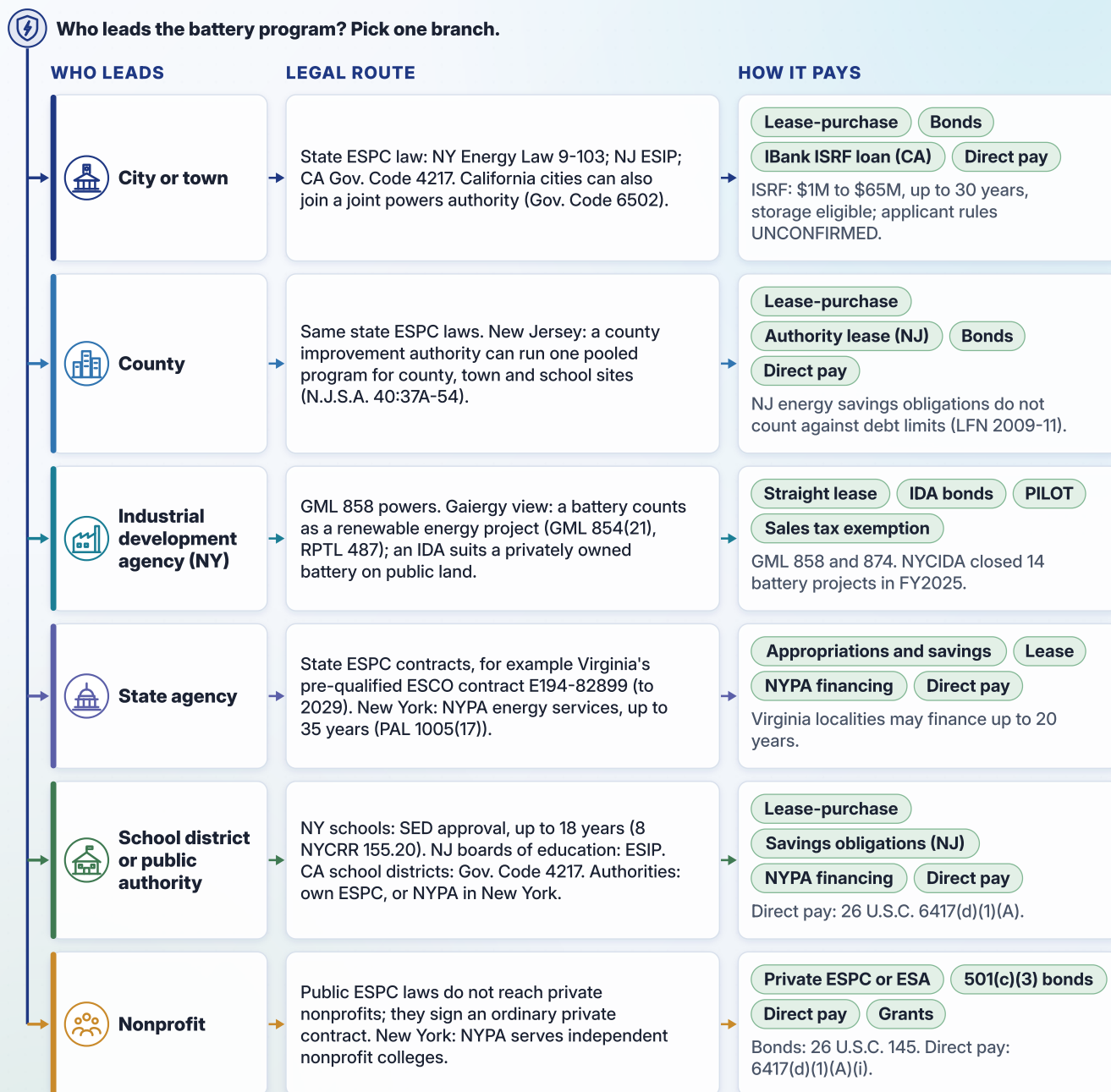
A city or county that owns its own battery is already tax-exempt, so an IDA adds little there. An IDA fits best when a private owner or ESCO owns a battery on public land: the IDA can be owner of record, turn a tax exemption into predictable payments to the town, county and school district, and issue conduit bonds. No case was found of an IDA assisting a battery that serves only a public building

UNCONFIRMED. New Jersey county improvement authorities can provide public facilities for county and municipal use (N.J.S.A. 40:37A-54^[322]); Morris County pooled solar for many towns under a 2010 lease-purchase; the developer's parent later transferred its assets to an assignee for creditors, the project company defaulted, and in 2020 the authority consented to a new company taking over the capital improvements (MCIA Resolution 20-28^[323]). California offers infrastructure loans that can cover “generation or storage of electrical energy” (California IBank ISRF^[324]).



Figure 54. An industrial park shares one battery yard next to its own substation. Illustration, Gaiergy.

Six kinds of owner, six legal routes

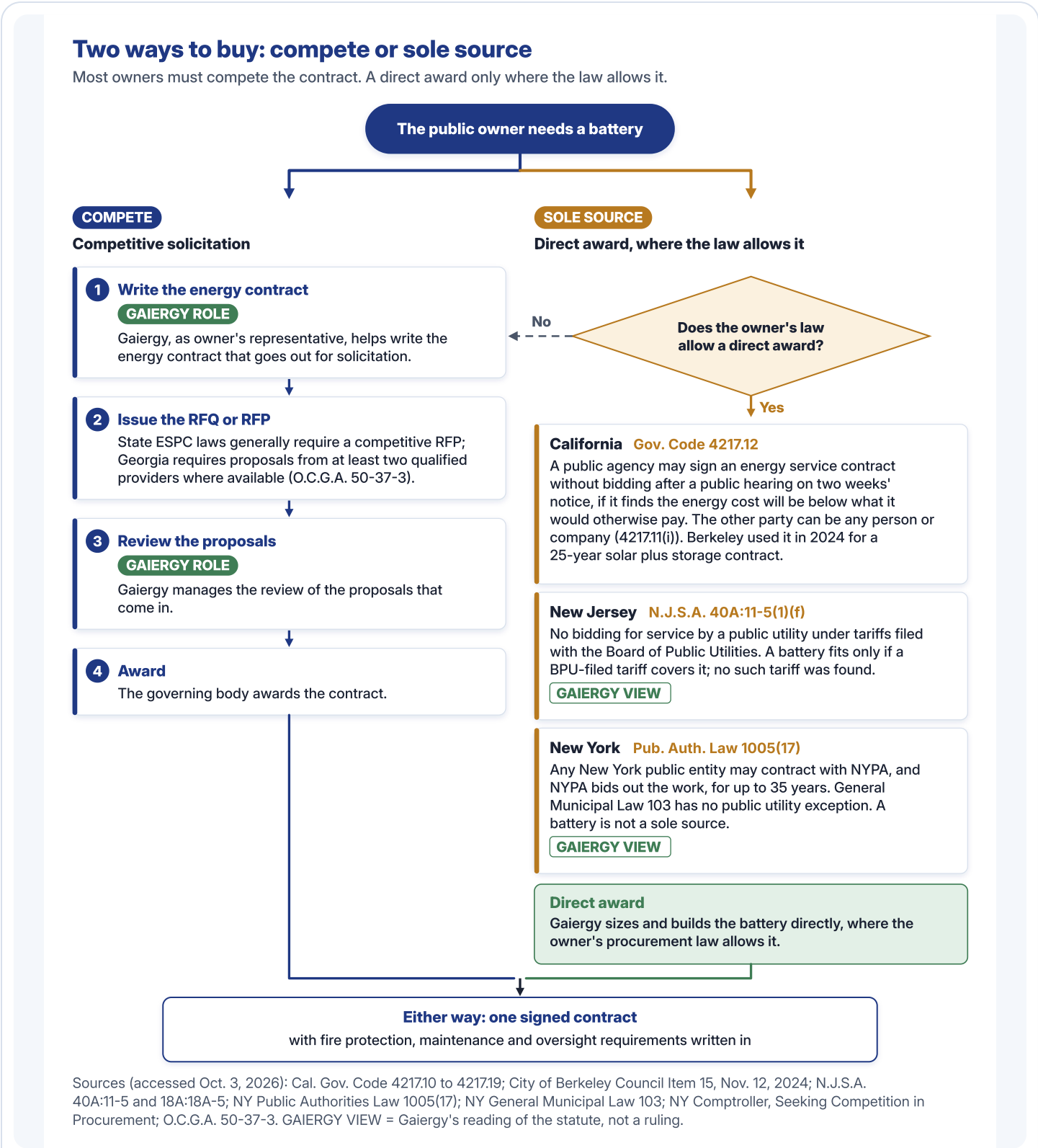


Sources: NY Energy Law 9-103; NJ P.L.2009 c.4 and DCA LFN 2009-11; CA Gov. Code 4217 and 6502; NY GML 854, 858, 874 and RPTL 487; NYCIDA FY2025 report; N.J.S.A. 40:37A-54; CA IBank ISRF criteria (06-2023); Virginia contract E194-82899; NY PAL 1005(17); 8 NYCRR 155.20; 26 U.S.C. 145 and 6417. Accessed 2026-10-02 or 2026-10-03.

Figure 55. Who leads the program, and how it pays: six kinds of owner, each with its legal route and payment options. Gaergy graphic based on the state, IDA and California sources in this section (NY Energy Law 9-102, 9-103^[1]; NJ P.L.2009 c.4; P.L.2012 c.55^[11]; Cal. Gov. Code 4217:10-19^[12]; Cal. Gov. Code 6502^[115]; NY GML 858^[33]; California IBank ISRF^[324]).

15.5 Compete or sole source

Most battery contracts are competed. Sole sourcing is possible only where the law allows it.



- **New York:** General Municipal Law 103 calls for bidding above \$35,000 for public works and \$20,000 for purchases, with no utility exception (NY GML 103^[86]). New York allows a sole source only under the State Comptroller's sole-source test, where one supplier can meet the need (NY Comptroller procurement guide^[87]). An Energy Law contract may be procured by request for proposals instead (NY Energy Law 9-102, 9-103^[11]).
- **New Jersey:** ESCOs *"shall be hired through the competitive contracting process and cannot be hired through the professional services exception"* (NJ DCA LFN 2009-11^[67]).
- **California:** Government Code 4217.12 lets a governing body award an energy service contract after public hearing findings; Berkeley's staff called it *"a single-source procurement"* (Cal. Gov. Code 4217.10-.19^[12]; Berkeley Council 2024^[85]).

15.6 Why owners use a representative

90%

of ESPC programs in top-rated states provide technical project oversight (DOE 2021, owner's representatives^[318])

2% to 3%

of annual savings: typical annual M&V cost (DOE 2021, owner's representatives^[318])

\$250,000

saved on one state capitol project when the owner's representative found a cheaper fix (DOE 2021, owner's representatives^[318])

2 of 5

New York school districts audited relied only on the ESCO's own savings reports (NY Comptroller 2015-MR-1^[319])

DOE says *"many state ESPC program administrators recommend or require the use of third-party technical consultants, or 'owner's representatives'"* (DOE 2021, owner's representatives^[318]). DOE's model scope has the representative review the audit and M&V plan, negotiate with the ESCO for the owner, and review commissioning and M&V reports (DOE ESPC toolkit App. B^[325]). New Jersey writes third-party review into law at the audit, the plan and the guarantee (NJ P.L.2012 c.55^[27]).

15.7 Financing through qualified lenders

DOE tells owners to *"Competitively solicit financing"* (DOE ESPC toolkit App. A^[65]). The common public forms are a tax-exempt lease, a lease-purchase and certificates of participation (Section 5). Gaiergy brings qualified ESPC and UESC lenders to the table and helps compare their terms. In New Jersey the financing cannot pay for maintenance, guarantees or their verification, so O&M is budgeted separately (NJ P.L.2012 c.55^[27]).

15.8 Fire protection, maintenance and oversight

The requirements come from Sections 10 and 14: fire code compliance, an emergency plan with responder training, 24/7 monitoring, availability and augmentation terms, and an annual report. New Jersey's local

finance notice puts the risk plainly: “If there is no ESCO guarantee and the owner fails to properly maintain the system, savings will be lost” (NJ DCA LFN 2009-11^[67]).

15.9 End of life: often a better replacement

When a battery reaches the end of its life, the best answer may be a newer one in the same yard. New products have arrived every few years:



More energy per unit

- One maker's unit: 3 MWh (2019 page) (Tesla Megapack page 2019^[326]), 3.9 MWh (shipping 2022), about 5 MWh (announced 2025) PRESS ONLY (pv magazine USA 2025^[327])
- Another maker: 6.25 MWh in a 20-foot container (2024) (CATL 2024^[328])



Lower price

- Battery pack prices: \$156/kWh in 2019 (BNEF 2019^[329]), \$108/kWh in 2025, with stationary storage packs at \$70/kWh (BNEF 2025^[297])



Small efficiency gains

- Round-trip efficiency inputs of 87% to 91% in 2018 (Lazard LCOS 4.0^[330]) against 92.0% to 93.7% on a current datasheet for one maker's 2-hour and 4-hour units (datasheet date UNCONFIRMED) (Tesla Megapack 2 XL datasheet^[331])
- NREL still plans on 85% and a 15-year life (NREL/TP-6A40-93281^[217])



Not a smooth curve

- Lazard reports storage cost up about 27% from 2020 to 2026, from higher capital cost, rates and tariffs PRESS ONLY (ESS News 2026^[332])

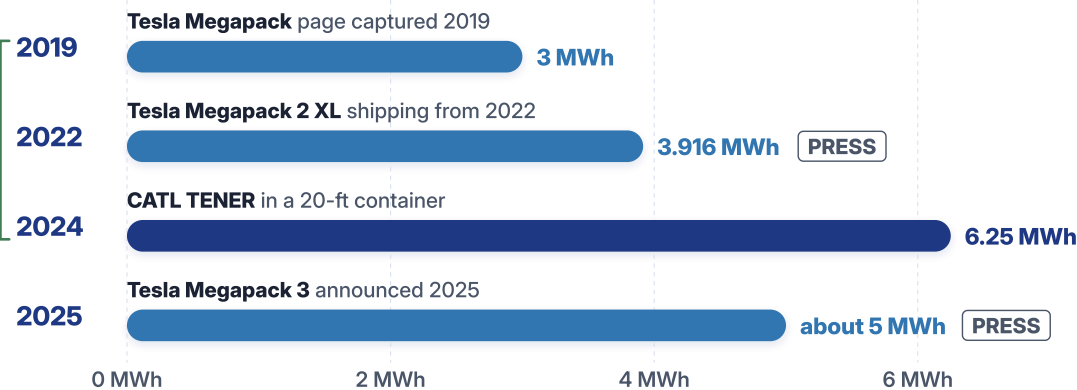
GAIERGY VIEW

Gaiergy expects a meaningful step in batteries every 4 to 5 years: more energy per container, lower prices and longer rated life, with small efficiency gains. Makers have released new products every 2 to 3 years, so this is a cautious figure (Tesla Megapack page 2019^[326]; pv magazine USA 2025^[327]; CATL 2024^[328]). Recommendation: consider a contract that lets the owner replace modules or whole units with a newer product at a planned point, instead of only topping up the old one.

Each replacement battery is bigger and longer-lived

More energy per unit and longer rated life. Prices are in the next figure.

More energy in each unit



2019 to 2024: a 4 to 5 year replacement window [GAIERGY VIEW](#)

Tesla units are not the same size as a 20-ft container, so the steps are not a pure density gain.

Longer rated life

Rated cycles are vendor claims, not field results.

Tesla Megablock (2025)

more than 10,000 cycles; 25-year life [VENDOR](#) [PRESS](#)

Gotion 587 Ah container (2025)

more than 12,000 cycles [VENDOR](#) [PRESS](#)

CATL TENER (2024)

more than 15,000 cycles

[VENDOR](#) [PRESS](#) [UNCONFIRMED](#)

Warranty

Tesla Megapack 2 XL warranty: 15 years, extendable to 20 (datasheet).

Planning life

NREL still plans on a 15-year life: no 4-hour battery has yet reached 15 years.

Efficiency changed little

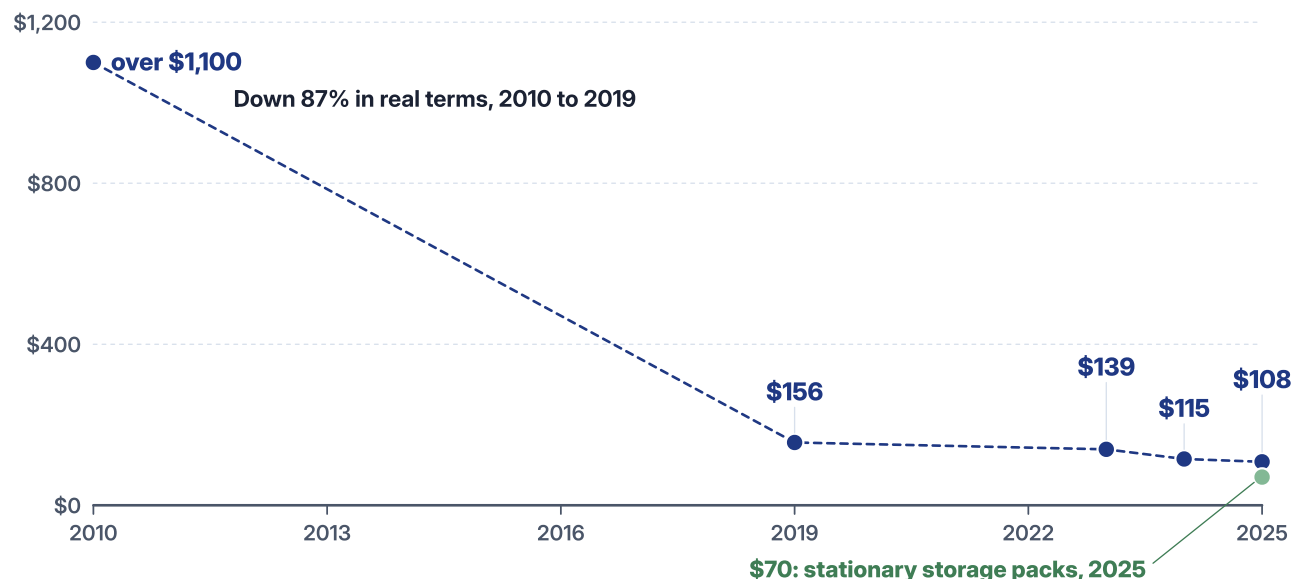
About 87% round trip in 2018 model inputs (Lazard) to about 92 to 94% in 2022 to 2025 datasheets.

Sources (accessed Oct. 3, 2026): Tesla Megapack page, Wayback capture 2019-07-30; Tesla Megapack 2 XL datasheet (filed with CT Siting Council PE1607); pv magazine USA, 2025-09-09 (Megapack 3, Megablock); CATL TENER release, 2024-04-12; New Atlas, April 2024 (TENER cycles); ESS News, 2025-04-16 (Gotion); Lazard LCOS 4.0 (2018); NREL/TP-6A40-93281 (2025). VENDOR = maker's claim; PRESS = news report; UNCONFIRMED = not found in the maker's own release.

Figure 57. Each replacement battery is bigger and longer-lived; prices are in the next figure. The 4 to 5 year replacement window is Gaiergy's view. Gaiergy graphic based on maker and press sources (Tesla Megapack page 2019^[326]; Tesla Megapack 2 XL datasheet^[331]; pv magazine USA 2025^[327]; CATL 2024^[328]; New Atlas, April 2024^[333]; ESS News, April 16, 2025^[334]; Lazard LCOS 4.0^[330]; NREL/TP-6A40-93281^[217]).

Battery pack prices keep falling

BNEF average pack price, all uses, in dollars per kWh.



Dots are surveyed years only; the dashed line does not show the years between.

Counterpoint

Lazard: storage cost up about 27% since 2020 (levelized cost, 100 MW, 4-hour system). Pack prices and installed system costs are different measures.

PRESS

Why plan on 4 to 5 years

Vendors released new generations about every 2 to 3 years, so a 4 to 5 year replacement plan is conservative.

GAIERGY VIEW

Sources (accessed Oct. 3, 2026): BNEF battery price survey press releases, 2019-12-03 (\$156; above \$1,100 in 2010; 87% fall), 2023-11-27 (\$139), 2024-12-10 (\$115) and 2025-12-09 (\$108; stationary \$70); ESS News, 2026-07-13, reporting the Lazard 2026 LCOE+ report (27%). PRESS = news report. GAIERGY VIEW = Gaiergy's reading.

Figure 58. Battery pack prices keep falling: the average pack price, all uses, in dollars per kWh. Gaiergy graphic based on BloombergNEF price surveys and the Lazard 2026 report as covered by ESS News (BNEF 2019^[329]; BNEF 2023 price survey^[295]; BNEF 2024 price survey^[296]; BNEF 2025^[297]; ESS News 2026^[332]).

15.10 Working with Gaiergy

Gaiergy Corp works for the public or nonprofit owner. Each service can be used alone or together. Gaiergy Corp. gaiergy.com

Sources

What this section shows: every source cited above, in order of first use, with its web address and the date accessed.

1. New York Energy Law s.9-102 and s.9-103, energy performance contracts, NYS Open Legislation. <https://www.nysenate.gov/legislation/laws/ENG/9-103>. Accessed 2026-10-02.
2. EPRI with TWAICE and PNNL, Insights from EPRI's Battery Energy Storage Systems (BESS) Failure Incident Database: Analysis of Failure Root Cause, White Paper, May 2024, product 3002030360 (Figures 4 and 6; pp. 3 to 14). <https://restservice.epri.com/publicdownload/000000003002030360/0/Product>. Accessed 2026-10-02.
3. EPRI, Global Grid-Scale Storage Deployment and Failures chart (failure incidents per GWh deployed, data to 2025-12-31), BESS Failure Incident Database. https://energystorage.epri.com/hub/public/assets/Failure_Rate_Chart_2026-Cf6DHOli.png. Accessed 2026-10-02.
4. US EPA, "Performance Contracting and Energy Service Agreements". <https://www.epa.gov/statelocalenergy/performance-contracting-and-energy-service-agreements>. Accessed 2026-10-03.
5. eCFR, 24 C.F.R. 990.185, Utilities expense level: incentives for energy conservation and rate reduction. <https://www.ecfr.gov/current/title-24/subtitle-B/chapter-IX/part-990/subpart-D/section-990.185>. Accessed 2026-10-03.
6. Northern States Power Company (Minnesota), Minnesota Electric Rate Book MPUC No. 2, Section 5, Sheets 90 to 90.3, Resiliency Service Program, Rate Code A43. https://www.xcelenergy.com/staticfiles/xe-responsive/Company/Rates%20%20Regulations/Me_Section_5.pdf. Accessed 2026-10-03.
7. United States Code, 2024 edition, 42 U.S.C. 8287, Authority to enter into contracts (energy savings performance contracts), with amendment notes. <https://www.govinfo.gov/content/pkg/USCODE-2024-title42/html/USCODE-2024-title42-chap91-subchapVII-sec8287.htm>. Accessed 2026-10-02.
8. US DOE Federal Energy Management Program (FEMP), Federal Energy Savings Performance Contracts Frequently Asked Questions on the Scope of 42 U.S.C. 8287 et seq., July 2022 (Questions 11, 16, 18, 19, 20, 27, 34). <https://www.energy.gov/femp/articles/federal-energy-savings-performance-contracts-frequently-asked-questions-scope-42-usc>. Accessed 2026-10-02.
9. Verdant Associates, 2024 SGIP Impact Evaluation (PDF pp. 22, 60 to 61). https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/self-generation-incentive-program/2024_sgip_impact_evaluation-final-%281%29.pdf. Accessed 2026-10-02.
10. McLaren and Mullendore, Identifying Potential Markets for Behind-the-Meter Battery Energy Storage: A Survey of U.S. Demand Charges, NREL/BR-6A20-68963, 2017, p.2. <https://docs.nlr.gov/docs/fy17osti/68963.pdf>. Accessed 2026-10-02.
11. New Jersey P.L.2009, c.4 (Energy Savings Improvement Program), as amended by P.L.2012, c.55. https://pub.njleg.gov/bills/2008/PL09/4_.HTM. Accessed 2026-10-02.

12. California Government Code s.4217.10 to 4217.19 (energy conservation contracts). https://leginfo.ca.gov/faces/codes_displayText.xhtml?lawCode=GOV&division=5.&title=1.&part=&chapter=3.2.&article=. Accessed 2026-10-02.
13. City of Santa Barbara, City Council Minutes, Regular Meeting March 10, 2026 (Police Station Power Purchase and Battery Energy Storage Services Agreement, Ordinance 2026-6214). <https://docs.santabarbaraca.gov/publicaccess/api/Document/AayLNYP AUyrLlrsoCnKVrbk%C3%89ToB79iQw2RPghxnn0l2E6JI%C3%8989xEQTRqibqWQlaM5v6N0EB3gEFCFVZ6BHYTnZ8%3D/>. Accessed 2026-10-03.
14. City of San Diego, Department of General Services, Energy and Water Savings Performance Contract (EWSPC) page. <https://www.sandiego.gov/general-services/energy/muni-energy/ESPC>. Accessed 2026-10-02.
15. Montgomery County, MD, Council Transportation and Environment Committee packet, 2021-04-15, item TE2B (Brookville bus depot microgrid), pp. 1 and 6. https://www.montgomerycountymd.gov/council/Resources/Files/agenda/cm/2021/20210415/20210415_TE2B.pdf. Accessed 2026-10-03.
16. New York Public Authorities Law s.1005, subdivision 17 (NYPA energy-related projects for public entities), NYS Open Legislation. <https://www.nysenate.gov/legislation/laws/PBA/1005>. Accessed 2026-10-02.
17. Sonoma State University news, "SSU turns sunlight into energy stability, campus resilience," 2026. <https://news.sonoma.edu/articles/2026/ssu-turns-sunlight-energy-stability-campus-resilience>. Accessed 2026-10-03.
18. SUNY Fredonia, NYPA, Oriden and Solar Liberty joint release, 2020-07-07 (reprinted by POWER magazine). <https://www.powermag.com/press-releases/working-together-for-clean-energy-suny-fredonia-nypa-oriden-and-solar-liberty-team-up-for-premier-solar-energy-project>. Accessed 2026-10-03.
19. 8 NYCRR 155.20, school district energy performance contracts (Commissioner of Education regulation), current through 2021-09-15. <https://govt.westlaw.com/nycrr/Document/I366331d8c2221ddb29d8bee567fca9f>. Accessed 2026-10-02.
20. RWE Clean Energy, "Greenburgh Central School District and RWE partner on \$20.5 million construction of distributed renewable energy solutions and energy efficiency improvements," 2024-08-27. <https://americas.rwe.com/-/media/RWE/RWE-USA/documents/2024-08-27-greenburgh-central-school-district-and-rwe-partner-on-20-5m-construction.pdf>. Accessed 2026-10-02.
21. Newark Board of Education, Energy Savings Improvement Program page. <https://www.nps.k12.nj.us/departments/facilities/energy-savings-improvement-program/>. Accessed 2026-10-03.
22. Irvine Ranch Water District news, "IRWD and Macquarie Capital Announce Completion of the Largest Behind-the-Meter Energy Storage Project in the U.S.," 2018. <https://www.irwd.com/liquid-news/irvine-ranch-water-district-and-macquarie-capital-announce-completion-of-the-largest-behind-the-meter-energy-storage-project-in-the-u-s>. Accessed 2026-10-03.
23. United States Code, 2024 edition, 49 U.S.C. 47107, Project grant application approval conditioned on assurances (s.47107(a)(13), (b)). <https://www.govinfo.gov/content/pkg/USCODE-2024-title49/html/USCODE-2024-title49-subtitleVII-partB-chap471-subchapl-sec47107.htm>. Accessed 2026-10-02.
24. City of Fresno City Council, legislation ID 26-566, First Amendment to the Energy Services Agreements with FFP BTM Solar, LLC (Fresno Yosemite International Airport), passed 2026-05-21. <https://agendas.fresno.gov/en/legislation/id-26-566-21268>. Accessed 2026-10-02.

25. US HUD, Notice PIH 2024-27, Guidance on Energy Performance Contracts, 2024-08-09 (Wayback copy of 2025-03-21). https://web.archive.org/web/20250321131319/https://www.hud.gov/sites/dfiles/PIH/document/s/PIH_2024-27.pdf. Accessed 2026-10-03.
26. US HUD Energy Branch, Office of Public Housing Programs, "HUD Energy Branch Solar Overview: HUD Solar Lunch and Learn," slides, July 2023. <https://files.hudexchange.info/resources/documents/HUD-Energy-Branch-Solar-Lunch-and-Learn.pdf>. Accessed 2026-10-03.
27. New Jersey P.L.2012, c.55 (Energy Savings Improvement Program amendments). https://pub.njleg.gov/bills/2012/PL12/55_.HTM. Accessed 2026-10-02.
28. Massachusetts Executive Office of Energy and Environmental Affairs, "Healey-Driscoll Administration Awards More Than \$40 Million to Power Critical Facilities During Outages," 2026-09-18. <https://www.mass.gov/news/healey-driscoll-administration-awards-more-than-40-million-to-power-critical-facilities-during-outages>. Accessed 2026-10-03.
29. New York City Housing Authority, press release, rooftop solar leases and Borinquen Plaza battery with NYPA, 2023-04-25. <https://www.nyc.gov/site/nycha/about/press/pr-2023/pr-20230425.page>. Accessed 2026-10-03.
30. Constellation, Newark Housing Authority energy performance contracts case study (vendor). https://www.constellation.com/content/dam/constellation/for-your-commercial-business/case-studies/government/Newark_Housing_Authority_Case_Study_111122.pdf. Accessed 2026-10-03.
31. New York General Municipal Law s.854, IDA definitions (s.854(4), (21)), NYS Open Legislation. <https://www.nysenate.gov/legislation/laws/GMU/854>. Accessed 2026-10-03.
32. New York Real Property Tax Law s.487 (electric energy storage equipment), NYS Open Legislation. <https://www.nysenate.gov/legislation/laws/RPT/487>. Accessed 2026-10-03.
33. New York General Municipal Law s.858, IDA purposes and powers, NYS Open Legislation. <https://www.nysenate.gov/legislation/laws/GMU/858>. Accessed 2026-10-03.
34. New York General Municipal Law s.874, IDA tax exemptions, NYS Open Legislation. <https://www.nysenate.gov/legislation/laws/GMU/874>. Accessed 2026-10-03.
35. New York City Industrial Development Agency, FY2025 Operations and Accomplishments, October 2025. <https://edc.nyc/sites/default/files/2025-10/Tab%20001.%20NYCIDA%20FY2025%20Operations%20and%20Accomplishments.pdf>. Accessed 2026-10-03.
36. 26 U.S.C. 6417, Elective payment of applicable credits, Legal Information Institute. <https://www.law.cornell.edu/uscode/text/26/6417>. Accessed 2026-10-02.
37. ENFRA (formerly Bernhard), Hackensack Meridian Health project page. <https://enfrasolutions.com/projects/hackensack-meridian-health/>. Accessed 2026-10-03.
38. United States Code, 2024 edition, 42 U.S.C. 8256, Incentives for agencies (utility incentive programs, s.8256(c)). <https://www.govinfo.gov/content/pkg/USCODE-2024-title42/html/USCODE-2024-title42-chap91-subchapIII-partB-sec8256.htm>. Accessed 2026-10-02.
39. Ameresco, "Ameresco Completes 10 Megawatt Distributed Energy Security Project at Marine Corps Recruit Depot Parris Island," press release, 2019-06-19. <https://ir.ameresco.com/news-events/press-releases/detail/351/amesco-completes-10-megawatt-distributed-energy-security>. Accessed 2026-10-02.

40. Mongird, Viswanathan et al., 2020 Grid Energy Storage Technology Cost and Performance Assessment, Lithium-ion methodology, PNNL, December 2020 (pp. 1 to 3). https://www.pnnl.gov/sites/default/files/media/file/Lithium-ion_Methodology.pdf. Accessed 2026-10-02.
41. NYSEDA, New York Battery Energy Storage System Guidebook for Local Governments, November 2024 (2020 Fire Code of New York State s.1206 excerpt, ch. 3.3; Model Law). <https://www.nyserda.ny.gov/-/media/Project/Nyserda/Files/Programs/Clean-Energy-Siting/battery-storage-guidebook.pdf>. Accessed 2026-10-02.
42. US DOE FEMP, Lithium-Ion Battery Energy Storage System Technical Specifications, 2025 template (posted 2026-03). https://www.energy.gov/sites/default/files/2026-03/technical-specifications-lithium-ion-battery-storage_2025.docx. Accessed 2026-10-02.
43. US DOE FEMP, Battery Energy Storage System Procurement Checklist, February 2023. <https://www.energy.gov/sites/default/files/2025-02/battery-energy-storage-system-procurement-checklist-feb-2023.docx>. Accessed 2026-10-02.
44. UL Standards and Engagement, "ULSE publishes third edition of UL 9540, Energy Storage Systems and Equipment," 2023-06-28. <https://ulse.org/insight/news-ulse-publishes-third-edition-ul-9540-energy-storage-systems-and-equipment/>. Accessed 2026-10-02.
45. California Public Utilities Commission, Resolution ESRB-13 adopting General Order 167-C, 2025-03-13 (issued 2025-05-20). <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M566/K891/566891631.pdf>. Accessed 2026-10-02.
46. US Energy Information Administration, Today in Energy, id 41813 (utility-scale batteries), 2019. <https://www.eia.gov/todayinenergy/detail.php?id=41813>. Accessed 2026-10-03.
47. Pacific Northwest National Laboratory, PNNL-37058, Case Studies in Leveraging Performance Contracts for Resilience Projects, December 2024. https://www.pnnl.gov/main/publications/external/technical_reports/PNNL-37058.pdf. Accessed 2026-10-02.
48. US DOE FEMP, M&V Guidelines: Measurement and Verification for Performance-Based Contracts, Version 5.0, September 2024 (Section 6.14.1, Battery Energy Storage Systems; Section 6.15). https://www.energy.gov/sites/default/files/2024-10/mv_guide_5_0.pdf. Accessed 2026-10-02.
49. Cleantech San Diego, "San Diego Airport and ENGIE Storage further airport's strategic energy initiative" (reprint of the ENGIE Storage and airport announcement), 2019. <https://cleantechsandiego.org/san-diego-airport-and-engie-storage-further-airports-strategic-energy-initiative/>. Accessed 2026-10-02.
50. National Grid, Upstate New York Business, Electric Demand Response page (CSRP, DLRP, Term-DLM, Auto-DLM). <https://www.nationalgridus.com/Upstate-NY-Business/Demand-Response/Electric-Demand-Response>. Accessed 2026-10-02.
51. National Grid, Distribution Load Relief Program flyer EE7015 (2/26), Upstate New York. https://www.nationalgridus.com/media/pdfs/bus-ways-to-save/ny/ee7015-ny-dlrp-flyer-2_26.pdf. Accessed 2026-10-02.
52. National Grid, Vintage Year 2027 Term- and Auto-DLM Request for Proposals, section 4.4, Auto-DLM Location Details (substations and feeders). https://www.nationalgridus.com/media/pdfs/dlm-auto-dlm-program-rfp/2027/vintage_year_2027_term-_and_auto-dlm_rfp.pdf. Accessed 2026-10-02.
53. National Grid, Massachusetts Business, ConnectedSolutions page. <https://www.nationalgridus.com/MA-Business/Energy-Saving-Programs/ConnectedSolutions>. Accessed 2026-10-02.

54. Mass Save, C&I ConnectedSolutions Offering Materials, June 2023 (5-year incentive rate lock for daily dispatch). https://www.masssave.com/-/media/Files/PDFs/Business/CI-ConnectedSolutions-Offering-Materials_June-2023.pdf. Accessed 2026-10-02.
55. Con Edison, Smart Usage Rewards page (Rider T, Commercial System Relief Program). <https://www.coned.com/en/save-money/rebates-incentives-tax-credits/rebates-incentives-tax-credits-for-commercial-industrial-buildings-customers/smart-usage-rewards>. Accessed 2026-10-02.
56. California Public Utilities Commission, Emergency Load Reduction Program page. <https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/electric-costs/demand-response-dr/emergency-load-reduction-program>. Accessed 2026-10-02.
57. Sterling Municipal Light Department energy storage overview (Clean Energy Group host). <https://www.cleangroup.org/wp-content/uploads/Sterling-Overview.pdf>. Accessed 2026-10-02.
58. Byrne et al., The Value Proposition for Energy Storage at the Sterling Municipal Light Department, Sandia National Laboratories, SAND2017-1093. https://www.cleangroup.org/wp-content/uploads/SterlingMA_2017_PES_SAND2017-1093.pdf. Accessed 2026-10-02.
59. Massachusetts Municipal Wholesale Electric Company, Energy Storage page. <https://www.mmwec.org/how-we-are-green/energy-storage/>. Accessed 2026-10-02.
60. United States Code, 2024 edition, 42 U.S.C. 8287c, Definitions (energy savings; energy savings performance contract). <https://www.govinfo.gov/content/pkg/USCODE-2024-title42/html/USCODE-2024-title42-chap91-subchapVII-sec8287c.htm>. Accessed 2026-10-02.
61. US DOE FEMP, Best Practices for Smart Grid-Interactive Efficient Building Ready Performance Contracts, 2024. <https://www.energy.gov/sites/default/files/2024-10/gebs-performance-contracts-best-practices.pdf>. Accessed 2026-10-02.
62. US DOE FEMP, Kickstart Your Federal Microgrid Project: Financing Opportunities and Best Practices, fact sheet, 2025. <https://www.energy.gov/sites/default/files/2025-08/femp-financing-microgrids-fact-sheet-2025.pdf>. Accessed 2026-10-02.
63. Massachusetts General Laws c.25A, s.3, s.11C and s.11I (energy management services). <https://malegislature.gov/Laws/GeneralLaws/PartI/TitleII/Chapter25A/>. Accessed 2026-10-02.
64. Pennsylvania Guaranteed Energy Savings Act, 62 Pa.C.S. 3751 to 3758 (Title 62 Chapter 37 PDF). <https://www.palegis.us/statutes/consolidated/view-statute?txtType=PDF&ttl=62&div=0&chpt=37>. Accessed 2026-10-02.
65. US DOE, Guidelines for a State ESPC Program, Appendix A-1, Owner Process Steps, April 2016. https://www.energy.gov/sites/prod/files/2016/04/f30/Appendix%20A%20-%20ESPC%20-%20Owner%20Process%20Steps_27Apr16_FINAL.pdf. Accessed 2026-10-03.
66. NYSEERDA (prepared by VHB), Energy Performance Contracts for Local Governments: Industry Standards and Best Practices Guide, June 2013, pp. 4 to 10. <https://www.nyserda.ny.gov/-/media/Project/Nyserda/Files/Programs/Clean-Energy-Communities/Energy-Performance-Contracts-for-Local-Governments.pdf>. Accessed 2026-10-03.
67. NJ Department of Community Affairs, Division of Local Government Services, Local Finance Notice 2009-11, Implementing an Energy Savings Improvement Program, June 2009. <https://nj.gov/dca/divisions/dlgs/lfn/09/2009-11.doc>. Accessed 2026-10-03.

68. US DOE, Guidelines for a State ESPC Program, Appendix D, Establish a Process, April 2016. https://www.energy.gov/sites/default/files/2016/04/f30/Appendix%20D%20-%20Establish%20a%20Process_27Apr16_FINAL.pdf. Accessed 2026-10-03.
69. Hawaii Department of Transportation, "Airports to go green, reduce energy costs by \$518 million," 2013-12-18. <https://hidot.hawaii.gov/airports/airports-to-go-green-reduce-energy-costs-by-518-million/>. Accessed 2026-10-02.
70. Florida Statutes s.489.145, Guaranteed energy, water, and wastewater performance savings contracting. http://www.leg.state.fl.us/statutes/index.cfm?App_mode=Display_Statute&URL=0400-0499/0489/Sections/0489.145.html. Accessed 2026-10-02.
71. Colorado Energy Office, Energy Performance Contracting page. <https://energyoffice.colorado.gov/epc>. Accessed 2026-10-03.
72. Commonwealth of Virginia, Division of Purchases and Supply, Contract Summary E194-82899, Pre-Qualified Energy Savings Contractors, December 2021. <https://www.energy.virginia.gov/energy-efficiency/documents/ESPC/Important%20Links/Contract%20Summary%2012.2021.pdf>. Accessed 2026-10-03.
73. Washington Department of Enterprise Services, ESPC Program Description (2019, posted 2022). <https://www.des.wa.gov/sites/default/files/2022-06/ESPCProgramProcessDescription.pdf>. Accessed 2026-10-03.
74. US DOE, "Model Documents for an Energy Savings Performance Contract Project" (Wayback snapshot of 2022-11-30; the live page returns HTTP 404). <https://web.archive.org/web/20221130030541/https://www.energy.gov/eere/slsc/model-documents-energy-savings-performance-contract-project>. Accessed 2026-10-03.
75. US DOE, Energy Savings Performance Contract Generation 4 generic IDIQ contract, 2023 (Sections B.3, C.1, C.15, H.2; Attachment J-3 technology categories). <https://www.energy.gov/sites/default/files/2023-08/2023-doe-idmq-espc-generic-contract.pdf>. Accessed 2026-10-02.
76. US DOE FEMP, Frequently Asked Questions About Energy Savings Performance Contract Energy Sales Agreements. <https://www.energy.gov/femp/frequently-asked-questions-about-energy-savings-performance-contract-energy-sales-agreements>. Accessed 2026-10-02.
77. US DOE FEMP, Energy Savings Performance Contract ENABLE for Federal Projects (program retired March 2025). <https://www.energy.gov/cmei/femp/energy-savings-performance-contract-enable-federal-projects>. Accessed 2026-10-02.
78. US DOE FEMP, Energy Savings Performance Contracts (ESPCs), fact sheet. <https://www.energy.gov/cmei/femp/articles/energy-savings-performance-contracts-espcs>. Accessed 2026-10-02.
79. US Government Accountability Office, GAO-15-432, Energy Savings Performance Contracts: Additional Actions Needed to Improve Federal Oversight, 2015-06-17 (summary page). <https://www.gao.gov/products/gao-15-432>. Accessed 2026-10-02.
80. Revised Code of Washington ch. 39.35C, Energy conservation (incl. s.39.35C.010, .050, .140). <https://app.leg.wa.gov/RCW/default.aspx?cite=39.35C&full=true>. Accessed 2026-10-02.
81. New Jersey Revised Statutes 40A:11-5, Local Public Contracts Law exceptions (Justia, unofficial). <https://law.justia.com/codes/new-jersey/title-40a/section-40a-11-5/>. Accessed 2026-10-03.

82. Texas Local Government Code ch. 302, energy savings performance contracts. <https://statutes.capitol.texas.gov/Docs/LG/htm/LG.302.htm>. Accessed 2026-10-02.
83. Georgia Code Title 50 Chapter 37, Guaranteed Energy Savings Performance Contracting (GEFA copy, current through 2015). <https://gefa.georgia.gov/document/document/epc-act/download>. Accessed 2026-10-03.
84. New Jersey Revised Statutes 18A:18A-5, Public School Contracts Law exceptions (Justia, unofficial). <https://law.justia.com/codes/new-jersey/title-18a/section-18a-18a-5/>. Accessed 2026-10-03.
85. City of Berkeley, Council Item 15, "Contract: Ava Community Energy for Energy Resilient Critical Municipal Facilities 'Solar + Storage'," 2024-11-12. <https://berkeleyca.gov/sites/default/files/documents/2024-11-12%20Item%2015%20Contract%20Ava%20Community%20Energy.pdf>. Accessed 2026-10-03.
86. New York General Municipal Law s.103, competitive bidding, NYS Open Legislation. <https://www.nysenate.gov/legislation/laws/GMU/103>. Accessed 2026-10-03.
87. Office of the New York State Comptroller, "Seeking Competition in Procurement," Local Government Management Guide, p.5. <https://www.osc.ny.gov/files/local-government/publications/pdf/seekingcompetition.pdf>. Accessed 2026-10-03.
88. Xcel Energy Stories, "Xcel Energy and Gundersen Health System partner for 100% resilient, renewable campus," 2024-01-24. <https://stories.xcelenergy.com/stories/Xcel-Energy-and-Gundersen-Health-System-partner-for-100--resilient--renewable-campus>. Accessed 2026-10-03.
89. Georgia Public Service Commission staff, i2X / LBNL DER webinar presentation, December 2025, slide 9 (Resiliency Asset Service tariff). <https://emp.lbl.gov/sites/default/files/2025-12/GPSC%20-%20i2X%20DER%20Webinar%20Presentation.pdf>. Accessed 2026-10-03.
90. Ava Community Energy, Board Staff Report Item 16, Critical Municipal Facilities Greenbridge PPA, 2024-11-20. <https://avaenergy.org/wp-content/uploads/2024/11/16.-Item-16-CMF-Greenbridge-PPA-Action-Item.pdf>. Accessed 2026-10-03.
91. PSE&G, "Solar 4 All Pilot Program," presentation to the PJM DER Subcommittee, 2018-03-26. <https://pjm.com/-/media/committees-groups/subcommittees/ders/20180326/20180326-item-05-pseg-solar-4-all-example.ashx>. Accessed 2026-10-03.
92. PSE&G news release, Pennington Department of Public Works solar storage project placed in service, 2018-05-17. <https://nj.pseg.com/newsroom/newsrelease6>. Accessed 2026-10-03.
93. PSE&G, Engineered Solutions Program page. <https://mybizenergy.pseg.com/engineered-solutions-program>. Accessed 2026-10-02.
94. New York Public Service Commission, Case 14-M-0101, Order Adopting Regulatory Policy Framework and Implementation Plan, 2015-02-26, pp. 66 to 71. <https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7B0B599D87-445B-4197-9815-24C27623A6A0%7D>. Accessed 2026-10-03.
95. US DOE FEMP, Frequently Asked Questions About Federal Utility Energy Service Contracts (Questions 1 to 14). <https://www.energy.gov/cmei/femp/frequently-asked-questions-about-federal-utility-energy-service-contracts>. Accessed 2026-10-02.
96. US DOE FEMP, Utility Energy Service Contract Basics. <https://www.energy.gov/cmei/femp/utility-energy-service-contract-basics>. Accessed 2026-10-02.

97. US DOE FEMP, Utility Energy Service Contract Guide, 2025 Edition. https://www.energy.gov/sites/default/files/2025-09/utility-energy-service-contract-guide-95662_2025.pdf. Accessed 2026-10-02.
98. US DOE FEMP, 2020 Assisting Federal Facilities with Energy Conservation Technologies (AFFECT) federal agency recipients. <https://www.energy.gov/cmei/femp/2020-assisting-federal-facilities-energy-conservation-technologies-affect-federal-agency>. Accessed 2026-10-02.
99. Duke Energy, news release, "Duke Energy Florida announces three new battery storage sites, including special needs shelter," 2020-08-25. <https://news.duke-energy.com/releases/duke-energy-florida-announce-s-three-new-battery-storage-sites-including-special-needs-shelter-and-first-pairing-with-utility-solar>. Accessed 2026-10-02.
100. Duke Energy, news release, two new lithium-ion battery sites in Florida in service, 2022-08-17. <https://news.duke-energy.com/releases/duke-energy-supports-reliability-grid-operations-with-two-new-lithium-ion-battery-sites-in-florida-6877135>. Accessed 2026-10-02.
101. US EPA, RE-Powering America's Land case study, "Rutland, VT" (Stafford Hill solar and storage), 2016. https://www.epa.gov/sites/production/files/2016-07/documents/re_on_cl_rutland_case_study.pdf. Accessed 2026-10-02.
102. NYC Department of Citywide Administrative Services, press release 21-002, rooftop solar at 47 public schools and Wards Island, 2021-02-25 (NYPA to administer 20-year power purchase agreements). <https://www.nyc.gov/site/dcas/news/21-002/new-york-city-install-rooftop-solar-arrays-47-public-schools-wards-island-and-wastewater>. Accessed 2026-10-02.
103. MMWEC, West Boylston energy storage release, June 2026. <https://www.mmwec.org/wp-content/uploads/West-Boylston-energy-storage-release-6-26.pdf>. Accessed 2026-10-02.
104. SUNY New Paltz News, solar plus storage microgrid ribbon cutting, 2018-04-25. <https://sites.newpaltz.edu/news/?p=20855>. Accessed 2026-10-02.
105. PG&E, Energy Efficiency Financing (On-Bill Financing) page. <https://www.pge.com/en/save-energy-and-money/energy-saving-programs/energy-efficiency-programs-for-businesses/energy-efficiency-financing.html>. Accessed 2026-10-02.
106. PG&E, On-Bill Financing Customer and Contractor Handbook, October 2024 (pp. 2, 3, 8, 12, 42). https://www.pge.com/content/dam/pge/docs/save-energy-and-money/energy-savings-programs/handbook_obf.pdf. Accessed 2026-10-02.
107. California Public Utilities Commission, Decision 23-08-026 (clean energy financing), 2023-08-10, pp. 21 to 24. <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M517/K717/517717993.PDF>. Accessed 2026-10-02.
108. Town of Concord, MA, 2024 Special Town Meeting, Warrant Article 1 (Concord Municipal Light Plant battery borrowing). <https://concordma.gov/DocumentCenter/View/48195/2024-Special-Town-Meeting---Warrant-Article-1>. Accessed 2026-10-02.
109. Lawrence Berkeley National Laboratory (Chelminski, Wong, Robson), U.S. ESCO Industry Report: Industry Size and Recent Market Trends, 2022-2024, published September 2026 (slides 12, 17, 21, 53, 58 to 60, 68). https://eta-publications.lbl.gov/sites/default/files/2026-09/lbnl_esco_market_survey_final_for_publication_090926.pdf. Accessed 2026-10-02.

110. New York Power Authority, Energy Efficiency services page. <https://services.nypa.gov/Services/Decarbonization-Leadership/Energy-Efficiency>. Accessed 2026-10-02.
111. New York General Municipal Law s.109-b, installment purchase contracts, NYS Open Legislation. <https://www.nysenate.gov/legislation/laws/GMU/109-B>. Accessed 2026-10-02.
112. NJ Board of Public Utilities, Office of State Energy Services, ESIP memo to Local Educational Agencies, April 14, 2026 (NJ DOE broadcast 2026-04-22). <https://www.nj.gov/education/broadcasts/2026/apr/22/NJBPUENergySavingsImprovementProgramESIP.pdf>. Accessed 2026-10-03.
113. NJ Board of Public Utilities, notice, ESIP Revised RFP Template Utilized by Contracting Units, Docket QO26040129, 2026-05-20. <https://www.nj.gov/bpu/pdf/publicnotice/ESIP%20Stakeholder%20Notice%20CU%20RFP-05-20-26.pdf>. Accessed 2026-10-03.
114. California Public Utilities Code s.388 (qualified energy service company pools). https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=PUC§ionNum=388.. Accessed 2026-10-03.
115. California Government Code s.6502 (joint exercise of powers). https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=GOV§ionNum=6502.. Accessed 2026-10-03.
116. Nevada Revised Statutes ch. 333A, performance contracts for state agencies. <https://www.leg.state.nv.us/NRS/NRS-333A.html>. Accessed 2026-10-02.
117. Nevada Revised Statutes ch. 332 (local government performance contracts) and ch. 333A (state agencies). <https://www.leg.state.nv.us/NRS/NRS-332.html>. Accessed 2026-10-02.
118. Hawaii Revised Statutes s.36-41, energy performance contracting. https://www.capitol.hawaii.gov/hrscurrent/Vol01_Ch0001-0042F/HRS0036/HRS_0036-0041.htm. Accessed 2026-10-02.
119. Illinois Local Government Energy Conservation Act, 50 ILCS 515 (with 105 ILCS 5/Art. 19b and 110 ILCS 62). <https://www.ilga.gov/documents/legislation/ilcs/documents/005005150K5.htm>. Accessed 2026-10-02.
120. Maryland State Finance and Procurement s.12-301, energy performance contracts (public Westlaw site). <https://govt.westlaw.com/mdc/Document/N08D57B40EB8C11EC88EFDE48BD61F1BD>. Accessed 2026-10-02.
121. Colorado Revised Statutes 29-12.5-101 to -104 (CRS 2024 Title 29, pp. 347 to 350). <https://leg.colorado.gov/sites/default/files/images/olls/crs2024-title-29.pdf>. Accessed 2026-10-02.
122. Arizona Revised Statutes s.34-105, guaranteed energy cost savings contracts. <https://www.azleg.gov/ars/34/00105.htm>. Accessed 2026-10-02.
123. Minnesota Statutes s.16C.144 (state guaranteed energy savings contracts). <https://www.revisor.mn.gov/statutes/cite/16C.144>. Accessed 2026-10-02.
124. Minnesota Statutes s.471.345, subd. 13 (municipal guaranteed energy savings contracts). <https://www.revisor.mn.gov/statutes/cite/471.345>. Accessed 2026-10-02.
125. Ohio Revised Code s.717.02 (municipal energy conservation measures; with s.3313.372, 156.01, 156.04). <https://codes.ohio.gov/ohio-revised-code/section-717.02>. Accessed 2026-10-02.
126. Ohio Revised Code s.156.04 (state energy conservation installment contracts). <https://codes.ohio.gov/ohio-revised-code/section-156.04>. Accessed 2026-10-02.
127. North Carolina General Statutes ch. 143, Article 3B (s.143-64.17 to 143-64.17L). https://www.ncleg.gov/EnactedLegislation/Statutes/HTML/ByArticle/Chapter_143/Article_3B.html. Accessed 2026-10-02.

128. Connecticut General Statutes ch. 298 (s.16a-37x and 16a-37u). https://www.cga.ct.gov/current/pub/chap_298.htm. Accessed 2026-10-02.
129. Code of Virginia s.45.2-1702 to 45.2-1704, energy performance-based contracts. <https://law.lis.virginia.gov/vacodefull/title45.2/chapter17/article2/>. Accessed 2026-10-02.
130. United States Code, 2024 edition, 42 U.S.C. 8259, Definitions (energy conservation measures; Federal building), with amendment notes. <https://www.govinfo.gov/content/pkg/USCODE-2024-title42/html/USCODE-2024-title42-chap91-subchapIII-partB-sec8259.htm>. Accessed 2026-10-02.
131. United States Code, 2024 edition, 42 U.S.C. 8253, Energy management requirements (s.8253(f)(4)(B)). <https://www.govinfo.gov/link/uscode/42/8253?link-type=html>. Accessed 2026-10-02.
132. United States Code, 2024 edition, 10 U.S.C. 2911, Energy policy of the Department of Defense (s.2911(j) and statutory notes). <https://www.govinfo.gov/content/pkg/USCODE-2024-title10/html/USCODE-2024-title10-subtitleA-partIV-chap173-subchapl-sec2911.htm>. Accessed 2026-10-02.
133. United States Code, 2024 edition, 10 U.S.C. 2920, Energy resilience (s.2920(a)(1)). <https://www.govinfo.gov/content/pkg/USCODE-2024-title10/html/USCODE-2024-title10-subtitleA-partIV-chap173-subchapl-sec2920.htm>. Accessed 2026-10-02.
134. United States Code, 2024 edition, 10 U.S.C. 2913, Energy savings contracts and activities (utility incentive agreements, s.2913(d)). <https://www.govinfo.gov/content/pkg/USCODE-2024-title10/html/USCODE-2024-title10-subtitleA-partIV-chap173-subchapl-sec2913.htm>. Accessed 2026-10-02.
135. eCFR, 10 C.F.R. Part 436 Subpart B, Methods and Procedures for Energy Savings Performance Contracting (s.436.31, 436.34, 436.36). <https://www.ecfr.gov/current/title-10/chapter-II/subchapter-D/part-436/subpart-B>. Accessed 2026-10-02.
136. Connecticut Energy Storage Solutions (PURA program run by Eversource and UI), Program changes for April 1, 2026. <https://energystoragect.com/program-changes-for-april-1-2026/>. Accessed 2026-10-03.
137. Efficiency Maine Trust, Program Opportunity Notice EM-003-2027, Energy Storage System Program (applications July 1, 2026 to June 30, 2027). <https://www.efficiencymaine.com/docs/PON-EM-003-2027-ES-S-V1.pdf>. Accessed 2026-10-03.
138. Efficiency Maine Trust, Energy Storage System Projects program summary. https://www.efficiencymaine.com/docs/ESS_Program_Summary.pdf. Accessed 2026-10-03.
139. ComEd, Distributed Generation Rebates page (rebate under 220 ILCS 5/16-107.6). <https://www.comed.com/dgrebate>. Accessed 2026-10-03.
140. Omaha Public Power District, Business Curtailment Program (FlexDemand) page. <https://oppd.com/business/products-services/save-money-save-energy/business-curtailment-program/>. Accessed 2026-10-03.
141. Duke Energy news release, New Duke Energy program helps South Carolina nonresidential customers lower costs while supporting a growing grid (PowerShare Storage). <https://news.duke-energy.com/releases/new-duke-energy-program-helps-south-carolina-nonresidential-customers-lower-costs-while-supporting-a-growing-grid>. Accessed 2026-10-03.
142. Electric Reliability Council of Texas, About ERCOT page. <https://www.ercot.com/about>. Accessed 2026-10-03.

143. Oncor Electric Delivery, 2026 Commercial Load Management Standard Offer Program Manual. https://www.oncor.com/content/dam/oncorwww/eeepm/documents/commercial-resources/2026/2026_Commercial_LM_Program_Manual.pdf.coredownload.pdf. Accessed 2026-10-03.
144. Rocky Mountain Power, Wattsmart Battery Program page. <https://www.rockymountainpower.net/savings-energy-choices/wattsmart-battery-program.html>. Accessed 2026-10-03.
145. Internal Revenue Service, Elective pay and transferability frequently asked questions: Elective pay (Q3), page last reviewed 2026-03-07. <https://www.irs.gov/credits-deductions/elective-pay-and-transferability-frequently-asked-questions-elective-pay>. Accessed 2026-10-02.
146. eCFR, 26 C.F.R. 1.6417-2, Rules for making elective payment elections (s.1.6417-2(c)(4) owner rule). <https://www.ecfr.gov/current/title-26/section-1.6417-2>. Accessed 2026-10-02.
147. 26 U.S.C. 48E, Clean electricity investment credit, with Pub. L. 119-21 amendment notes, Legal Information Institute, Cornell Law School. <https://www.law.cornell.edu/uscode/text/26/48E>. Accessed 2026-10-02.
148. 26 U.S.C. 45Y, Clean electricity production credit (s.45Y(d)(3) applicable year; s.45Y(g)(12) elective payment domestic content rule), Legal Information Institute. <https://www.law.cornell.edu/uscode/text/26/45Y>. Accessed 2026-10-02.
149. Federal Energy Regulatory Commission, Office of Public Participation, Energy Markets page. <https://www.ferc.gov/opp/energy-markets>. Accessed 2026-10-03.
150. Federal Energy Regulatory Commission, FERC Order No. 2222: A New Day for Distributed Energy Resources, fact sheet, September 2020. <https://www.ferc.gov/sites/default/files/2020-09/E-1-facts.pdf>. Accessed 2026-10-03.
151. U.S. Energy Information Administration, Preliminary Monthly Electric Generator Inventory (EIA-860M), August 2026, sheet Operating (Gaiergy sum of rows with Technology = Batteries). https://www.eia.gov/electricity/data/eia860m/xls/august_generator2026.xlsx. Accessed 2026-10-03.
152. Public Utility Commission of Texas, 16 Tex. Admin. Code 25.513, Texas Backup Power Package Program rule (effective May 27, 2026). <https://www.puc.texas.gov/industry/electric/business/texas-energy-fund/#backup-power>. Accessed 2026-10-03.
153. Public Utility Commission of Texas, Texas Energy Fund page, Texas Backup Power Package Program. <https://www.puc.texas.gov/industry/electric/business/texas-energy-fund/>. Accessed 2026-10-03.
154. United States Code, 2024 edition, 49 U.S.C. 47133, Restriction on use of revenues. <https://www.govinfo.gov/content/pkg/USCODE-2024-title49/html/USCODE-2024-title49-subtitleVII-partB-chap471-subchapl-sec47133.htm>. Accessed 2026-10-02.
155. Federal Aviation Administration, Policy and Procedures Concerning the Use of Airport Revenue, 64 FR 7696, 1999-02-16 (Sections II.B, VI.B.1, VI.B.8, VII.C). <https://www.govinfo.gov/content/pkg/FR-1999-02-16/pdf/99-3529.pdf>. Accessed 2026-10-02.
156. California Energy Commission, CEC-500-2026-006, Redwood Coast Airport Microgrid Final Project Report, 2026 (pp. 15 to 16, 65 to 66, Table 9). <https://www.energy.ca.gov/sites/default/files/2026-01/CEC-500-2026-006.pdf>. Accessed 2026-10-02.
157. United States Code, 2024 edition, 49 U.S.C. 47102, Definitions (s.47102(3)(P)), with amendment notes for Pub. L. 118-63. <https://www.govinfo.gov/content/pkg/USCODE-2024-title49/html/USCODE-2024-title49-su>

[btitleVII-partB-chap471-subchapl-sec47102.htm](#). Accessed 2026-10-02.

158. Federal Aviation Administration, Reauthorization Program Guidance Letter 25-02, AIP Discretionary Set Aside, 2025-04-04. https://www.faa.gov/airports/aip/guidance_letters/R-PGL-25-02-AIP-Discretionary-Set-Aside. Accessed 2026-10-02.
159. Federal Aviation Administration, Reauthorization Program Guidance Letter 25-06, Planning Project Eligibility, 2025-05-12 (p.9). https://www.faa.gov/airports/aip/guidance_letters/R-PGL-25-06-Planning-Project-Eligibility. Accessed 2026-10-02.
160. United States Code, 2024 edition, 49 U.S.C. 47140, Meeting current and future energy power demand. <https://www.govinfo.gov/content/pkg/USCODE-2024-title49/html/USCODE-2024-title49-subtitleVII-partB-chap471-subchapl-sec47140.htm>. Accessed 2026-10-02.
161. Federal Aviation Administration, Order 5100.38D Change 1, Airport Improvement Program Handbook, 2019-02-26. <https://www.faa.gov/documentLibrary/media/Order/AIP-Handbook-Order-5100-38D-Chg1.pdf>. Accessed 2026-10-02.
162. Federal Aviation Administration, Draft AIP Handbook (Order 5100.38E) page, last updated 2026-09-03. https://www.faa.gov/airports/aip/aip_handbook/draft. Accessed 2026-10-02.
163. Federal Aviation Administration, Voluntary Airport Low Emissions Program (VALE) web page. <https://www.faa.gov/airports/environmental/vale>. Accessed 2026-10-02.
164. Federal Aviation Administration, Zero Emissions Airport Vehicle and Infrastructure Pilot Program Technical Guidance, version 2, 2022-03-08 (Section 5.0). https://www.faa.gov/sites/faa.gov/files/airports/environmental/zero_emissions_vehicles/Zero-Emissions-Vehicles-Tech-Guidance-v2.pdf. Accessed 2026-10-02.
165. Federal Aviation Administration, Bipartisan Infrastructure Law, Airport Infrastructure Grants web page. <https://www.faa.gov/iija/airport-infrastructure>. Accessed 2026-10-02.
166. American Association of Airport Executives, Regulatory Alert: FAA Releases \$653 Million in FY26 AIP Grants for Projects at Over 346 Airports, May 12, 2026 (trade group). https://alerts.aaae.org/latest/regulatory_051226. Accessed 2026-10-03.
167. American Association of Airport Executives, Regulatory Alert: FAA Releases \$1.1 Billion in FY26 AIP Grants for Projects at Over 382 Airports, July 1, 2026 (trade group). https://alerts.aaae.org/latest/regulatory_070126. Accessed 2026-10-03.
168. Federal Aviation Administration newsroom, Secretary Duffy Delivers Nearly \$615 Million to Improve Airports Across 42 States and Two Territories, August 20, 2026. <https://www.faa.gov/newsroom/trumps-transportation-secretary-sean-p-duffy-delivers-nearly-615-million-improve-airports>. Accessed 2026-10-03.
169. Federal Aviation Administration newsroom, Secretary Duffy Announces \$84.4 Million for Airport Improvements in Texas, North Carolina, and Wyoming, September 25, 2026. <https://www.faa.gov/newsroom/trumps-transportation-secretary-sean-p-duffy-announces-844-million-airport-improvements>. Accessed 2026-10-03.
170. 49 U.S.C. 47115(j), Airport Safety and Resilient Infrastructure Discretionary Program, with amendment notes for Pub. L. 118-63 section 714(a), Legal Information Institute. <https://www.law.cornell.edu/uscode/text/49/47115>. Accessed 2026-10-03.

171. Federal Aviation Administration, Airport Improvement Program (AIP) 2025-2027 Supplemental Appropriation page, last updated January 22, 2026. https://www.faa.gov/airports/aip/aip_supplemental_appropriation. Accessed 2026-10-03.
172. Fox59 News, "Carson: Trump administration plans to terminate Indy airport solar panel grant," 2025-10-07. <https://fox59.com/indianapolitics/carson-trump-administration-plans-to-terminate-indy-airport-solar-panel-grant/>. Accessed 2026-10-02.
173. Federal Aviation Administration, FY23 AIP Supplemental, notice of intent to award list (Indianapolis International Airport: solar array with battery storage, \$6,710,000). <https://www.faa.gov/media/84251>. Accessed 2026-10-03.
174. IndyStar, Federal government rescinds \$6.7 million energy grant for Indianapolis airport solar farm, October 8, 2025 (press). <https://www.indystar.com/story/news/politics/2025/10/08/trump-admin-cancels-6-7-million-grant-for-ind-airport-solar-farm-clear-energy/86567433007/>. Accessed 2026-10-03.
175. Redwood Coast Energy Authority, Redwood Coast Airport Microgrid project page. <https://redwoodenergy.org/about/community-impact/rcam/>. Accessed 2026-10-02.
176. EPB of Chattanooga (Jim Glass), PACE Industry Project Portfolio slides, US DOE, 2024 (battery table). https://www.energy.gov/sites/default/files/2024-09/Jim%20Glass_PACE%20Industry%20Project%20Portfolio.pdf. Accessed 2026-10-02.
177. Chattanooga Metropolitan Airport, Solar Farm page. <https://www.flycha.com/solar-farm>. Accessed 2026-10-02.
178. Columbia Metropolitan Airport, "CAE breaks ground on terminal energy project," 2026-06-17. <https://flycae.com/cae-breaks-ground-on-terminal-energy-project/>. Accessed 2026-10-02.
179. WIS News, "CAE breaks ground on terminal energy project, adding 700 parking spots," 2026-06-17. <https://www.wistv.com/2026/06/17/cae-breaks-ground-terminal-energy-project-adding-700-parking-spots/>. Accessed 2026-10-02.
180. New York Power Authority, press release, JFK solar carport and battery groundbreaking, 2024-04-23. <https://www.nypa.gov/News/Press-Releases/2024/20240423-jfk>. Accessed 2026-10-02.
181. Port Authority of New York and New Jersey, press release, New York State's largest solar power canopy and storage system at JFK, 2020-12-17. <https://www.panynj.gov/port-authority/en/press-room/press-release-archives/2020-press-releases/new-york-states-largest-solar-power-canopy-storage-system-at-jfk.html>. Accessed 2026-10-02.
182. Hawaii Department of Transportation, "HDOT continues sustainability efforts with installation of nearly 3,000 new solar panels," 2018. <https://hidot.hawaii.gov/airports/hdot-continues-sustainability-efforts-with-installation-of-nearly-3000-new-solar-panels/>. Accessed 2026-10-02.
183. eCFR, 26 C.F.R. 1.48E-2, Qualified facility and energy storage technology (s.1.48E-2(g)(6)(i)). <https://www.ecfr.gov/current/title-26/section-1.48E-2>. Accessed 2026-10-02.
184. eCFR, 26 C.F.R. 1.6417-1, Elective payment of applicable credits, definitions (s.1.6417-1(c) applicable entities). <https://www.ecfr.gov/current/title-26/section-1.6417-1>. Accessed 2026-10-02.
185. Clean Energy Group, webinar page, direct pay for a Washington church's resilient solar plus storage (Vashon United Methodist Church). <https://www.cleanegroup.org/webinar/direct-pay-washington-church-re>

[silient-solarstorage/](#). Accessed 2026-10-03.

186. 26 U.S.C. 145, Qualified 501(c)(3) bond, Legal Information Institute, Cornell Law School. <https://www.law.cornell.edu/uscode/text/26/145>. Accessed 2026-10-03.
187. 26 U.S.C. 50, Other special rules for credit (s.50(b)(4) government use; s.50(c)(3) basis), Legal Information Institute. <https://www.law.cornell.edu/uscode/text/26/50>. Accessed 2026-10-02.
188. 26 U.S.C. 7701 (s.7701(a)(52) material assistance thresholds; s.7701(e)(3) and (e)(4) service contracts for storage facilities), Legal Information Institute. <https://www.law.cornell.edu/uscode/text/26/7701>. Accessed 2026-10-02.
189. eCFR, 26 C.F.R. 1.6417-5, Elective payment registration. <https://www.ecfr.gov/current/title-26/section-1.6417-5>. Accessed 2026-10-02.
190. Internal Revenue Service, Notice 2024-9, elective payment domestic content exceptions. <https://www.irs.gov/pub/irs-drop/n-24-09.pdf>. Accessed 2026-10-02.
191. Internal Revenue Service, Notice 2024-84, extension of elective payment domestic content exception attestations. <https://www.irs.gov/pub/irs-drop/n-24-84.pdf>. Accessed 2026-10-02.
192. Internal Revenue Service, Notice 2026-15, prohibited foreign entity material assistance interim safe harbors. <https://www.irs.gov/pub/irs-drop/n-26-15.pdf>. Accessed 2026-10-02.
193. 26 U.S.C. 45 (s.45(b)(3), reduction for tax-exempt bond financing), Legal Information Institute. <https://www.law.cornell.edu/uscode/text/26/45>. Accessed 2026-10-02.
194. NREL (National Laboratory of the Rockies), Annual Technology Baseline 2024, Utility-Scale and Commercial Battery Storage pages. https://atb.nrel.gov/electricity/2024/utility-scale_battery_storage. Accessed 2026-10-02.
195. NREL (National Laboratory of the Rockies), Annual Technology Baseline 2025, Commercial Battery Storage page (with Utility-Scale and Residential pages). https://atb.nrel.gov/electricity/2025/commercial_battery_storage. Accessed 2026-10-02.
196. EPRI, Failure_Incident_Database_Stationary_Storage.csv (data file behind the BESS Failure Incident Database page). https://energystorage.epri.com/hub/public/Failure_Incident_Database_Stationary_Storage.csv. Accessed 2026-10-02.
197. DNV GL, McMicken Battery Energy Storage System Event: Technical Analysis and Recommendations, prepared for Arizona Public Service, Doc. 10209302-HOU-R-01, 2020-07-18 (EPRI archive copy). <https://epri.box.com/shared/static/eapg9tmt5bize3yqjb0wmz1rj5z07b9i.pdf>. Accessed 2026-10-02.
198. UL Firefighter Safety Research Institute, "Four Firefighters Injured In Lithium-Ion Battery Energy Storage System Explosion, Arizona," report page, 2020-07-29 (archived copy). <http://web.archive.org/web/20210622175537/https://ulfirefightersafety.org/posts/four-firefighters-injured-in-lithium-ion-battery-energy-storage-system-explosion.html>. Accessed 2026-10-02.
199. Merseyside Fire and Rescue Service, Significant Incident Report, Incident 018965, Orsted BESS, Carnegie Road, Liverpool, 2020 (EPRI archive copy). <https://epri.box.com/shared/static/ro9v9uyekoen9638b9e5etppd97rq113.pdf>. Accessed 2026-10-02.
200. EPRI, Carnegie Road Energy Storage System Failure Response, Recovery, and Rebuild Lessons Learned, White Paper, April 2023, product 3002026396. <https://restservice.epri.com/publicdownload/00000000300>

2026396/0/Product. Accessed 2026-10-02.

201. Energy Safe Victoria, Statement of Technical Findings: Fire at the Victorian Big Battery (EPRI archive copy). <https://epri.box.com/shared/static/zefzcuifdg33gwkepnvhcb2u4kov0rjy.pdf>. Accessed 2026-10-02.
202. US EPA, Moss Landing Battery Fire Response, slides to the Monterey County Board of Supervisors, 2025-09-12. <https://www.epa.gov/system/files/documents/2025-09/epa-moss-landing-fire-slides-monterey-county-board-of-supervisors-2025-09-12.pdf>. Accessed 2026-10-02.
203. Vistra Corp., Form 10-Q for the period ended 2026-06-30. <https://www.sec.gov/Archives/edgar/data/0001692819/000169281926000019/vistra-20260630.htm>. Accessed 2026-10-02.
204. US EPA On-Scene Coordinator, site profile, Gateway Energy Camino Lithium-Ion Battery Fire. https://response.epa.gov/site/site_profile.aspx?site_id=16485. Accessed 2026-10-02.
205. EPRI Storage Wiki, Failure Event: US, NY, East Hampton, 31 May 2023. https://storagewiki.epri.com/index.php/Failure_Event_-_US,_NY,_East_Hampton_-_31_May_2023. Accessed 2026-10-02.
206. EPRI Storage Wiki, Failure Event: US, NY, Warwick, 27 Jun 2023. https://storagewiki.epri.com/index.php/Failure_Event_-_US,_NY,_Warwick_-_27_Jun_2023. Accessed 2026-10-02.
207. EPRI Storage Wiki, Failure Event: US, NY, Chaumont, 27 Jul 2023. https://storagewiki.epri.com/index.php/Failure_Event_-_US,_NY,_Chaumont_-_27_Jul_2023. Accessed 2026-10-02.
208. New York Inter-Agency Fire Safety Working Group, Air, Soil, and Water Data Findings, December 2023, p.1. <https://www.nyserda.ny.gov/-/media/Project/Nyserda/Files/Programs/Clean-Energy-Siting/NYS-Data-Collection-Report.pdf>. Accessed 2026-10-02.
209. Vistra, Findings and Corrective Actions, Sept. 4, 2021, Incident, Moss Landing Energy Storage Facility, released 2022-01-21. <https://investor.vistracorp.com/download/20220121-Moss-Landing+Phase-I-Findings-and+Corrective+Actions.pdf>. Accessed 2026-10-02.
210. PG&E Currents, "PG&E Shares Findings of September 2022 Moss Landing Megapack Incident" (archived snapshot 2024-01-25). <https://web.archive.org/web/20240125201010/https://www.pgecurrents.com/articles/3832-pg-e-shares-findings-september-2022-moss-landing-megapack-incident>. Accessed 2026-10-02.
211. Neubauer and Simpson, Deployment of Behind-The-Meter Energy Storage for Demand Charge Reduction, NREL/TP-5400-63162, 2015, pp. 14 and 25. <https://docs.nlr.gov/docs/fy15osti/63162.pdf>. Accessed 2026-10-02.
212. Verdant Associates, 2020 SGIP Energy Storage Impact Evaluation, for the CPUC (PDF pp. 16, 21, 56, 58). <https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/self-generation-incentive-program/sgip-2020-energy-storage-impact-evaluation.pdf>. Accessed 2026-10-02.
213. NYISO, Manual 04, Installed Capacity Manual, Version 19.0, effective 2026-10-01 (Sections 4.12, 4.12.2.1.2; PDF pp. 194, 217). https://www.nyiso.com/documents/20142/2923301/icap_mnl.pdf. Accessed 2026-10-02.
214. PJM, Manual 18: PJM Capacity Market, Revision 63, effective 2026-09-24, PDF p.183. <https://www.pjm.com/-/media/documents/manuals/m18.ashx>. Accessed 2026-10-02.
215. Lazard, Levelized Cost of Energy+ (June 2025), LCOS Version 10.0 (PDF pp. 42, 43, 47). <https://www.lazard.com/media/uounhon4/lazards-lcoeplus-june-2025.pdf>. Accessed 2026-10-02.

216. Viswanathan et al., 2022 Grid Energy Storage Technology Cost and Performance Assessment, PNNL-33283 (pp. 39 to 43, 148 to 149). <https://www.pnnl.gov/sites/default/files/media/file/ESGC%20Cost%20Performance%20Report%202022%20PNNL-33283.pdf>. Accessed 2026-10-02.
217. Cole, Ramasamy and Turan, Cost Projections for Utility-Scale Battery Storage: 2025 Update, NREL/TP-6A40-93281, pp. 18 to 19. <https://docs.nlr.gov/docs/fy25osti/93281.pdf>. Accessed 2026-10-02.
218. NREL, Best Practices for Operation and Maintenance of Photovoltaic and Energy Storage Systems, 3rd Edition, NREL/TP-7A40-73822, 2018 (pp. 61, 74, 75, 92, 125 to 127). <https://docs.nlr.gov/docs/fy19osti/73822.pdf>. Accessed 2026-10-02.
219. Tesla, Powerwall Limited Warranty (USA), effective 2023-08-21. https://digitalassets.tesla.com/tesla-content/s/image/upload/Powerwall_Warranty_US-EN.pdf. Accessed 2026-10-02.
220. Tesla, Megapack Maintenance Agreement (web order form). <https://digitalassets.tesla.com/image/upload/prod/fulfillment/energy/Order/MegapackConfigurator/megapack-web-maintenance-agreement>. Accessed 2026-10-02.
221. Fluence Energy, Inc., Form 10-K for fiscal year ended 2024-09-30 (Revenue from Services; Product Performance Guarantees; Warranties). <https://www.sec.gov/Archives/edgar/data/1868941/000186894124000070/flnc-20240930.htm>. Accessed 2026-10-02.
222. Fluence, Smart Service Plans brochure BR-057-02. https://info.fluenceenergy.com/hubfs/Smart_Service_Plans_BR-057-02-EN.pdf. Accessed 2026-10-02.
223. Cole and Karmakar, Cost Projections for Utility-Scale Battery Storage: 2023 Update, NREL/TP-6A40-85332, p.13. <https://docs.nlr.gov/docs/fy23osti/85332.pdf>. Accessed 2026-10-02.
224. US DOE CESER and EERE, Cybersecurity Considerations for Distributed Energy Resources on the U.S. Electric Grid, October 2022. <https://www.energy.gov/sites/default/files/2022-10/Cybersecurity%20Considerations%20for%20Distributed%20Energy%20Resources%20on%20the%20U.S.%20Electric%20Grid.pdf>. Accessed 2026-10-02.
225. NYSERDA, New York Inter-Agency Fire Safety Working Group page. <https://www.nyserda.ny.gov/All-Programs/Energy-Storage-Program/New-York-Inter-Agency-Fire-Safety-Working-Group>. Accessed 2026-10-02.
226. New York Inter-Agency Fire Safety Working Group, Fire Code Recommendations, July 2024 (pp. 2 to 18). <https://www.nyserda.ny.gov/-/media/Project/Nyserda/Files/Programs/Energy-Storage/Fire-Code-Recommendations-Report.pdf>. Accessed 2026-10-02.
227. NYSERDA, "Governor Hochul Announces Draft Fire Code Language That Addresses Recommendations," 2024-07-26. <https://www.nyserda.ny.gov/About/Newsroom/2024-Announcements/2024-07-26-Governor-Hochul-Announces-Draft-Fire-Code-Language-That-Addresses-Recommendations>. Accessed 2026-10-02.
228. California Public Utilities Code s.761.3. https://leginfo.ca.gov/faces/codes_displaySection.xhtml?lawCode=PUC§ionNum=761.3. Accessed 2026-10-02.
229. Texas Department of Insurance, State Fire Marshal's Office, Battery energy storage systems page, 2025-02-14. <https://tdi.texas.gov/Fire/battery-energy-storage-systems.html>. Accessed 2026-10-02.
230. US EPA, Lithium-Ion Battery Recycling page, last updated 2026-09-18. <https://www.epa.gov/hw/lithium-ion-battery-recycling>. Accessed 2026-10-02.

231. Montgomery County, MD, news release, completion of the David F. Bone EMTOC transit depot microgrid, 2026-04-30. <https://www.montgomerycountymd.gov/news/montgomery-county-executive-marc-elrich-lt-gov-aruna-miller-council-vice-president-marilyn-balcombe-celebrate-completion-nations-largest-transit-depot-microgrid>. Accessed 2026-10-03.
232. Solar Power World, "California county jail to save \$12 million in energy costs with solar carport and Tesla battery," 2026-04-14. <https://www.solarpowerworldonline.com/2026/04/california-county-jail-to-save-12-million-in-energy-costs-with-solar-carport-and-tesla-battery/>. Accessed 2026-10-03.
233. PSE&G news release, "Marking National Battery Day with a solar and battery combination that returns a municipal landfill to productive use," 2020-02-18. <https://nj.pseg.com/newsroom/newsrelease134>. Accessed 2026-10-03.
234. Cal Poly San Luis Obispo, Facilities Management and Development, "Solar PV and Battery Storage" project page. <https://afd.calpoly.edu/facilities/planning-capital-projects/project-news/solar-pv>. Accessed 2026-10-03.
235. Energy Toolbase, "Energy Toolbase deploys storage portfolio for school district" case study (battery controls supplier). <https://www.energytoolbase.com/case-studies/energy-toolbase-deploys-storage-portfolio-for-school-district/>. Accessed 2026-10-02.
236. Veregy, "Project of the Year: MSD Wayne," 2023-05-24. <https://veregy.com/project-of-the-year-msd-wayne/>. Accessed 2026-10-02.
237. Johnson Controls, customer story, "Advancing a renewable energy future while modernizing campus infrastructure" (University of Hawaii community colleges). <https://www.johnsoncontrols.com/customer-stories/customer-success-stories/university-of-hawaii>. Accessed 2026-10-02.
238. University of Hawaii News, "Maui College aims to be first 100 percent renewable energy," 2018-03-19. <https://www.hawaii.edu/news/2018/03/19/maui-college-aims-to-be-first-100-percent-renewable-energy/>. Accessed 2026-10-02.
239. Ameresco, project highlight, "Roseburg Urban Sanitary Authority, OR: Driving Renewable Energy Innovation and Resilience in Wastewater Management," 2025. <https://www.ameresco.com/wp-content/uploads/2025/07/roseburg-urban-sanitary-authority-solar-pv-project.pdf>. Accessed 2026-10-02.
240. Microgrid Knowledge, "Microgrid for wastewater in California: Ameresco" (citing the McKinleyville bid packet). <https://www.microgridknowledge.com/microgrid-wastewater-california-ameresco>. Accessed 2026-10-02.
241. McKinleyville Community Services District, Board agenda, 2020-02-05, item E.12, Award Ameresco contract for WWMF Microgrid Project. <https://mckinleyvillecsd.specialdistrict.org/files/b1d22de39/Agenda+February+5%2C+2020.pdf>. Accessed 2026-10-02.
242. MMWEC, Wakefield Beebe Substation battery ribbon cutting release, 2019. <https://www.mmwec.org/wp-content/uploads/Wakefield-Ribbon-Cutting-Release-2019.pdf>. Accessed 2026-10-02.
243. SDG&E Today, "SDG&E unveils four advanced microgrids to boost grid resilience and reliability," 2024-02-13. <https://www.sdgetoday.com/news/sdge-unveils-four-advanced-microgrids-boost-grid-resilience-and-reliability>. Accessed 2026-10-02.
244. SDG&E Today, "SDG&E completes Ramona microgrid in partnership with CAL FIRE and US Forest Service," 2022-04-18. <https://www.sdgetoday.com/news/sdge-completes-ramona-microgrid-partnership-cal-fire-and>

d-us-forest-service. Accessed 2026-10-02.

245. Clean Energy Group, "Boston Medical Center Battery Storage Case Study," April 2025. <https://www.cleaneenergy.org/wp-content/uploads/Boston-Medical-Center-Battery-Storage-Case-Study.pdf>. Accessed 2026-10-03.
246. California Energy Commission, CEC-500-2019-034, A Novel, Renewable Energy Microgrid for a California Healthcare Facility (Kaiser Permanente Richmond), April 2019. <https://www.energy.ca.gov/sites/default/files/2021-06/CEC-500-2019-034.pdf>. Accessed 2026-10-03.
247. US DOE FEMP, Air Force Invests in Resilience and Cost Savings at Joint Base San Antonio Using Energy Savings Performance Contract. <https://www.energy.gov/cmei/femp/air-force-invests-resilience-and-cost-savings-joint-base-san-antonio-using-energy-savings>. Accessed 2026-10-02.
248. Ameresco, "Ameresco to Partner with the United States Coast Guard on First Battery Energy Storage System Project at Training Center Petaluma," press release, 2021-10-12. <https://www.ameresco.com/ameresco-to-partner-with-the-united-states-coast-guard-on-first-battery-energy-storage-system-project-at-training-center-petaluma/>. Accessed 2026-10-02.
249. Ameresco, "U.S. Navy Partners with Ameresco for \$173 Million Cleantech Energy Project at Norfolk Naval Shipyard," press release, 2021-02-05. <https://www.ameresco.com/u-s-navy-partners-with-ameresco-for-173-million-cleantech-energy-project-at-norfolk-naval-shipyard>. Accessed 2026-10-02.
250. US General Services Administration, news release, "GSA Administrator cuts ribbon on grid-interactive" Oklahoma City federal building project, 2023-05-11. <https://www.gsa.gov/about-gsa/newsroom/news-releases/gsa-administrator-cuts-ribbon-on-gridinteractive-05112023>. Accessed 2026-10-02.
251. Ameresco, "Ameresco awarded 6 MW battery energy storage system (BESS) at U.S. Army's Fort Detrick base," press release, 2022-05-03. <https://www.ameresco.com/ameresco-awarded-6-mw-battery-energy-storage-system-bess-at-u-s-armys-fort-detrick-base/>. Accessed 2026-10-02.
252. US Army, "U.S. Army signs lease to add battery energy storage to existing solar project on Fort Detrick," 2022-03-18. https://www.army.mil/article/254823/u_s_army_signs_lease_to_add_battery_energy_storage_to_existing_solar_project_on_fort_detrick. Accessed 2026-10-02.
253. Piper Sandler, California Public Finance Weekly Market Update, September 28, 2026, p.4 (Bloomberg BVAL AAA 20-year 4.91%) and p.23. https://www.pipersandler.com/sites/default/files/document/092826_CAMarketUpdate.pdf. Accessed 2026-10-02.
254. PG&E, Electric Schedule B-20, Sheets 1 and 4 and Section 6, Advice 7846-E, effective March 1, 2026. https://www.pge.com/tariffs/assets/pdf/tariffbook/ELEC_SCHS_B-20.pdf. Accessed 2026-10-02.
255. PNNL, Energy Storage Cost and Performance Database v2024, Lithium-ion LFP, 2023, 1 MW, 2 h, Point. https://www.pnnl.gov/sites/default/files/media/file/ESGC_Cost_Performance_Database_v2024.xlsx. Accessed 2026-10-02.
256. National Grid, Upstate NY Business, Service Rates page, Large General (SC-3) delivery charges (no effective date shown). <https://www.nationalgridus.com/Upstate-NY-Business/Rates/Service-Rates>. Accessed 2026-10-02.
257. Niagara Mohawk Power Corporation, PSC No. 220, Statement of Demand Response Incentives No. 7, effective May 1, 2025. https://www.nationalgridus.com/media/pdfs/bus-ways-to-save/demand_response_incentive_statement.pdf. Accessed 2026-10-02.

258. National Grid, Commercial System Relief Program (CSRP) Program Guidelines, Upstate New York. https://www.nationalgridus.com/media/pdfs/bus-ways-to-save/csrp_program_overview.pdf. Accessed 2026-10-02.
259. U.S. Energy Information Administration, Electric Power Annual, Table 2.4, Average Price of Electricity to Ultimate Customers by End-Use Sector. https://www.eia.gov/electricity/annual/html/epa_02_04.html. Accessed 2026-10-02.
260. Gagnon, Govindarajan, Bird (NREL), Barbose, Darghouth, Mills (LBNL), Solar + Storage Synergies for Managing Commercial-Customer Demand Charges, Executive Summary, October 2017, pp. 1 to 4. <https://eta-publications.lbl.gov/sites/default/files/solarstorage-execsummary.pdf>. Accessed 2026-10-03.
261. Anderson, Burman, Simpkins (NREL) and Helson, Lisell, Case (CUNY), New York Solar Smart DG Hub-Resilient Solar Project: Economic and Resiliency Impact of PV and Storage on New York Critical Infrastructure, NREL/TP-7A40-66617, June 2016, pp. v to vii, 1 to 2. <https://docs.nlr.gov/docs/fy16osti/66617.pdf>. Accessed 2026-10-03.
262. NREL, Valuing the Resilience Provided by Solar and Battery Energy Storage Systems, NREL/FS-6A20-70679, 2018, pp. 3 to 4 (copy via the Internet Archive). <https://www.nrel.gov/docs/fy18osti/70679.pdf>. Accessed 2026-10-03.
263. NREL (USAID-NREL Partnership), "Battery Storage for Resilience" webinar slides, 2021-06-01 (third-party host). <https://www.ccreee.org/wp-content/uploads/2021/06/Battery-Storage-for-Resilience-NREL.pdf>. Accessed 2026-10-03.
264. NREL (now National Laboratory of the Rockies), REopt Evaluates Energy Security Measures for the Department of Defense, project page (copy via the Internet Archive). <https://www.nrel.gov/reopt/projects/case-study-defense>. Accessed 2026-10-03.
265. NY PSC, New York State Standardized Interconnection Requirements for distributed generators and energy storage systems 5 MW or less, effective 2026-02-09, pp. 26 to 29. <https://dps.ny.gov/nys-standardized-interconnection-requirements>. Accessed 2026-10-03.
266. NREL, REopt Lite Tutorial: Resilience Outputs, 2020, pp. 1 to 3 (copy via the Internet Archive). <https://www.nrel.gov/docs/fy20osti/76678.pdf>. Accessed 2026-10-03.
267. NJ Board of Public Utilities, Order, Town Center Distributed Energy Resource Microgrid Phase II Incentive Program, Agenda Item 8B, 2021-03-03. <https://nj.gov/bpu/pdf/boardorders/2021/20210303/8B%20-%20ORDER%20TCDER%20II.pdf>. Accessed 2026-10-03.
268. NYC Department of Transportation, Electric Vehicles page. <https://www.nyc.gov/html/dot/html/motorist/electric-vehicles.shtml>. Accessed 2026-10-03.
269. New York Power Authority, EVolve NY home page. <https://evolveny.nypa.gov/>. Accessed 2026-10-03.
270. City of Hoboken, City of Hoboken expands EV charging, November 3, 2023. <https://hobokennj.gov/news/city-of-hoboken-expands-ev-charging-furthering-hoboken-climate-action-plan>. Accessed 2026-10-03.
271. DCFCTracker, EVgo Charging Price Report, October 2026 (third-party tracker). <https://dcfctracker.com/reports/evgo>. Accessed 2026-10-03.
272. DCFCTracker, Electrify America Charging Price Report, October 2026 (third-party tracker). <https://dcfctracker.com/reports/electrify-america>. Accessed 2026-10-03.

273. DCFC Tracker, Tesla Supercharger Charging Price Report, October 2026 (third-party tracker). <https://dcfctracker.com/reports/tesla>. Accessed 2026-10-03.
274. NYC Department of Transportation, Municipal Parking Facilities list with EV charging rates. <https://www.nyc.gov/html/dot/html/motorist/parkinglist.shtml>. Accessed 2026-10-03.
275. City of San Jose, Electric Vehicles and Chargers page. <https://www.sanjoseca.gov/your-government/departments-offices/transportation/driving/electric-vehicles-chargers>. Accessed 2026-10-03.
276. Niagara Mohawk (National Grid), P.S.C. No. 220, VDER-CRED Statement No. 109, effective August 31, 2026. https://www.nationalgridus.com/media/pdfs/billing-payments/electric-rates/upstate-ny/2026/stat_vder-cred_109_effective_august_31_2026.pdf. Accessed 2026-10-03.
277. New York Independent System Operator, day-ahead zonal LBMP, monthly CSV archives, January to December 2025. <http://mis.nyiso.com/public/csv/damlbmp/>. Accessed 2026-10-03.
278. Con Edison, P.S.C. No. 10, VDER-CRED Statement, effective October 1, 2026. <https://www.coned.com/-/media/files/coned/documents/rates/electric/psc-10/other/vder-value-stack-credits/vder-cred-202610.pdf>. Accessed 2026-10-03.
279. N.J.A.C. 14:8-4.3, Net metering general provisions, Legal Information Institute. <https://www.law.cornell.edu/regulations/new-jersey/N-J-A-C-14-8-4-3>. Accessed 2026-10-03.
280. PSE&G, BGS-RSCP Price to Compare, effective June 1, 2026. <https://nj.pseg.com/-/media/pseg/public-site/documents/current-electric-tariff/electric-ptc-website--2026-06-01---proposed.ashx>. Accessed 2026-10-03.
281. PSE&G, B.P.U.N.J. No. 17 Electric tariff, Rate Schedule GLP and Section 15 Net Metering, sheets effective October 1, 2026. <https://nj.pseg.com/-/media/pseg/public-site/documents/current-electric-tariff/electric-tariff-17-cefev-iap-nits-usf-effective-20261001.ashx>. Accessed 2026-10-03.
282. Monitoring Analytics, 2025 State of the Market Report for PJM, Section 3, Table 3-53. https://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2025/2025-som-pjm-sec3.pdf. Accessed 2026-10-03.
283. PG&E, Electric Schedule NBT, Net Billing Tariff. https://www.pge.com/tariffs/assets/pdf/tariffbook/ELEC_SCH_EDS_NBT.pdf. Accessed 2026-10-03.
284. PG&E, Solar Billing Plan 2026 Energy Export Credit Values, 2026 interconnection year. <https://www.pge.com/energyexportcredit>. Accessed 2026-10-03.
285. SDG&E, LY2026 NBT Pricing Upload (MIDAS), NBT26 hourly export prices. <https://www.sdge.com/solar/solar-billing-plan/export-pricing>. Accessed 2026-10-03.
286. National Laboratory of the Rockies (formerly NREL), PVWatts v8 hourly solar profiles, 1 kW, 10 degree tilt (Syracuse shown; Albany, New York City, Newark, Sacramento and San Diego saved alongside). <https://developer.nlr.gov/api/pvwatts/v8.json>. Accessed 2026-10-03.
287. National Grid Upstate NY, EV Phase-In Rate Guide, version 1.2, July 2026 (CM10692). https://www.nationalgridus.com/media/pdfs/bus-ways-to-save/ev/cm10692_ev_phase-in_rate_guide.pdf. Accessed 2026-10-03.
288. Con Edison, EV Phase-In Rates page. <https://www.coned.com/en/accounts-billing/your-bill/ev-phase-in-rates>. Accessed 2026-10-03.

289. New York Public Service Commission, PSC approves beneficial utility rates for electric vehicle charging stations, Case 22-E-0236, January 19, 2023. <https://dps.ny.gov/psc-approves-beneficial-utility-rates-electric-vehicle-charging-stations>. Accessed 2026-10-03.
290. PG&E, Electric Schedule BEV, Business Electric Vehicle rate, rates effective March 1, 2026. https://www.pge.com/tariffs/assets/pdf/tariffbook/ELEC_SCHEDS_BEV.pdf. Accessed 2026-10-03.
291. Tesla, Wall Connector support page (11.5 kW at 48 A; Model 3 and Model Y RWD and AWD limited to 7.7 kW). <https://www.tesla.com/support/charging/wall-connector>. Accessed 2026-10-03.
292. EVgo Inc., EVgo Inc. Reports Second Quarter 2026 Results, August 5, 2026 (GlobeNewswire). <https://www.globenewswire.com/news-release/2026/08/05/3339220/0/en/EVgo-Inc-Reports-Second-Quarter-2026-Results.html>. Accessed 2026-10-03.
293. NREL, Battery Energy Storage for Electric Vehicle Charging Stations (battery-buffered DC fast charging), DOE/GO-102024-6237, 2024 (copy via the Internet Archive). <https://www.nrel.gov/docs/fy24osti/89493.pdf>. Accessed 2026-10-03.
294. Massachusetts DOER and Sustainable Energy Advantage, SMART Programmatic Review, Task 1 Final Report: Evaluation of Solar Costs and Needed Incentive Levels across Sectors from 2025-2030, March 2024. <https://www.mass.gov/doc/evaluation-of-solar-costs-and-needed-incentive-levels-across-sectors-from-2025-2030/download>. Accessed 2026-10-03.
295. BloombergNEF, Lithium-Ion Battery Pack Prices Hit Record Low of \$139/kWh, press release, November 27, 2023. <https://about.bnef.com/insights/clean-energy/lithium-ion-battery-pack-prices-hit-record-low-of-139-kwh/>. Accessed 2026-10-03.
296. BloombergNEF, Lithium-Ion Battery Pack Prices See Largest Drop Since 2017, Falling to \$115 per Kilowatt-Hour, press release, December 10, 2024. <https://about.bnef.com/insights/commodities/lithium-ion-battery-pack-prices-see-largest-drop-since-2017-falling-to-115-per-kilowatt-hour-bloombergnef/>. Accessed 2026-10-03.
297. BloombergNEF, press release, lithium-ion battery pack prices fall to \$108 per kWh, 2025-12-09. <https://about.bnef.com/insights/commodities/lithium-ion-battery-pack-prices-fall-to-108-per-kilowatt-hour-despite-rising-metal-prices/>. Accessed 2026-10-03.
298. Public Law 119-21 (One Big Beautiful Bill Act), 2025-07-04 (s.70512, s.70513). <https://www.govinfo.gov/content/pkg/PLAW-119publ21/pdf/PLAW-119publ21.pdf>. Accessed 2026-10-02.
299. 26 U.S.C. 30C, Alternative fuel vehicle refueling property credit, Legal Information Institute. <https://www.law.cornell.edu/uscode/text/26/30C>. Accessed 2026-10-03.
300. Niagara Mohawk (National Grid), P.S.C. No. 220, Statement of Supply Service Charges No. 181, August 2026. <https://www.nationalgridus.com/media/pdfs/billing-payments/electric-rates/upstate-ny/2026/statesc181-220.pdf>. Accessed 2026-10-03.
301. New Jersey Board of Public Utilities, Order Regarding the Three-Year Review of the Administratively Determined Incentive Program, May 21, 2026, Agenda Item 8C, Table 1. <https://www.nj.gov/bpu/pdf/boardorders/2026/20260521/8C%20ORDER%20ADI%203%20Year%20Review%20Cost%20Cap.pdf>. Accessed 2026-10-03.
302. New York City, Local Law 55 of 2024, electric vehicle supply equipment in parking garages and lots. https://www.nyc.gov/assets/buildings/local_laws/ll55of2024.pdf. Accessed 2026-10-03.

303. NREL, 2025Q1 PV System Cost Benchmark Model (commercial rooftop \$1.98 per Wdc; O&M \$40 per kWdc-year). <https://data.nrel.gov/system/files/304/1767739491-2025Q1%20PV%20System%20Cost%20Benchmark%20Model.zip>. Accessed 2026-10-03.
304. NYSERDA Report 22-03, Cost and Usage Trends for Electric Vehicle Chargers: Evidence from NYSERDA-Funded Level 2 Charging Stations in New York State, December 2021, Summary. <https://www.nyserda.ny.gov/v/-/media/Project/Nyserda/Files/Publications/Research/Transportation/22-03-Cost-and-Usage-Trends-for-Electric-Vehicle-Chargers.pdf>. Accessed 2026-10-03.
305. NREL TP-5400-85654, The 2030 National Charging Network (2023), Table 5. <https://www.nrel.gov/docs/fy23osti/85654.pdf>. Accessed 2026-10-03.
306. U.S. Department of Energy, Costs Associated With Non-Residential Electric Vehicle Supply Equipment, November 2015, Maintenance and Repair. https://afdc.energy.gov/uploads/publication/evse_cost_report_2015.pdf. Accessed 2026-10-03.
307. New Jersey Department of Environmental Protection, It Pay\$ to Plug In page and FAQ. <https://dep.nj.gov/dri vegreen/it-pays-to-plug-in/>. Accessed 2026-10-03.
308. Piscataway Township, NJ, news: Piscataway Continues to Go Green (ESIP with Schneider Electric). https://piscatawaynj.org/news_detail_T32_R63.php. Accessed 2026-10-03.
309. FHWA Center for Innovative Finance Support, Project Profile: Montgomery Microgrid Charging Depot P3, Maryland. https://www.fhwa.dot.gov/ipd/project_profiles/md_montgomery_micrgrid.aspx. Accessed 2026-10-03.
310. The City Record Online, Notice 20221006103, DCAS purchase of 71 Beam EV ARC solar carports, published October 12, 2022. <https://a856-cityrecord.nyc.gov/RequestDetail/20221006103>. Accessed 2026-10-03.
311. NYC DCAS, testimony of Keith Kerman to the NYC Council Committee on Transportation and Infrastructure, June 23, 2023. <https://www.nyc.gov/assets/dcas/downloads/pdf/fleet/dcas-electric-vehicle-infrastructure-hearing-testimony-2023-06-23.pdf>. Accessed 2026-10-03.
312. NYC DCAS, NYC Fleet Newsletter Issue 418, DCAS Expands Solar Carport Network, February 13, 2023. <https://www.nyc.gov/assets/dcas/downloads/pdf/fleet/nyc-fleet-newsletter-418-february-13-2023-dcas-expands-solar-carport-network.pdf>. Accessed 2026-10-03.
313. Arup, Renewable energy microgrid pioneers decarbonizing model for an EV bus transit system, project page (designer). <https://www.arup.com/projects/marthas-vineyard-transit-authority-microgrid>. Accessed 2026-10-03.
314. Enel X North America, 2022 POWER DE award release, Martha's Vineyard Transit Authority microgrid (vendor). https://enelnorthamerica.com/content/dam/enel-na/enel-x/Enel-X-2022-POWER-DE-Award_FINAL.pdf. Accessed 2026-10-03.
315. T&D World, Largest public electric vehicle charging center in California opens in Santa Clara (reprint of the Silicon Valley Power release), 2016. <https://www.tdworld.com/distribution/largest-public-electric-vehicle-charging-center-california-opens-santa-clara>. Accessed 2026-10-03.
316. FEMA P-1019, Emergency Power Systems for Critical Facilities: A Best Practices Approach to Improving Reliability, September 2014, p. 1-1 (WBDG host). <https://www.wbdg.org/FFC/DHS/femap1019.pdf>. Accessed 2026-10-03.

317. N.J.A.C. 14:8-5.5, Level 2 interconnection review (Cornell LII copy). <https://www.law.cornell.edu/regulations/new-jersey/N-J-A-C-14-8-5-5>. Accessed 2026-10-03.
318. US DOE, "An Ally in Your Corner: Benefits of Using Owner's Representatives," November 2021. <https://www.energy.gov/sites/default/files/2021-11/ally-in-your-corner-benefits-owner-representatives.pdf>. Accessed 2026-10-03.
319. Office of the New York State Comptroller, School Districts' Energy Performance Contracts, Report 2015-MR-1. <https://www.osc.ny.gov/sites/default/files/local-government/audits/2017-11/lgsa-audit-swr-2015-EPC-global.pdf>. Accessed 2026-10-03.
320. New York General Municipal Law s.859-a, IDA steps before financial assistance, NYS Open Legislation. <https://www.nysenate.gov/legislation/laws/GMU/859-A>. Accessed 2026-10-03.
321. New York City Industrial Development Agency, resolution inducing the financing of an industrial facility for Brigris 1B BESS, LLC as a straight-lease transaction, adopted April 23, 2024 (copy in NYCIDA board materials posted October 2025). <https://edc.nyc/sites/default/files/2025-10/Authorizing%20Resolution%20-%20Brigris%201B%20BESS.pdf>. Accessed 2026-10-03.
322. New Jersey Revised Statutes 40:37A-54, county improvement authority purposes (Justia, unofficial). <https://law.justia.com/codes/new-jersey/title-40/section-40-37a-54/>. Accessed 2026-10-03.
323. Morris County Improvement Authority, Resolution 20-28, Renewable Energy Program Tranche I, October 2020. <https://www.morriscountynj.gov/files/sharedassets/public/v/1/departments/improvement-authority/minutes-bill-lists-and-resolutions/mcia-resolution-20-28-consenting-to-capital-improvements-for-renewable-energy-program-tranche-1-october-2020.pdf>. Accessed 2026-10-03.
324. California Infrastructure and Economic Development Bank, ISRF Program Criteria, Priorities and Guidelines, June 2023. <https://ibank.ca.gov/wp-content/uploads/2022/12/ISRF-Criteria-06-2023.pdf>. Accessed 2026-10-03.
325. US DOE, Guidelines for a State ESPC Program, Appendix B, ESPC Program Overview incl. B-3 RFP and Contract for Project Facilitators, April 2016. https://www.energy.gov/sites/prod/files/2016/04/f30/Appendix%20B%20-%20ESPC%20Program%20Overview_27Apr16_FINAL.pdf. Accessed 2026-10-03.
326. Tesla, Megapack web page (Wayback capture 2019-07-30). <https://web.archive.org/web/20190730083101/https://www.tesla.com/megapack>. Accessed 2026-10-03.
327. pv magazine USA, "Tesla unveils new generation of utility-scale batteries," 2025-09-09. <https://pv-magazine-usa.com/2025/09/09/tesla-unveils-new-generation-of-utility-scale-batteries/>. Accessed 2026-10-03.
328. CATL press release, TENER energy storage system launch, 2024-04 (PR Newswire). <https://kyodonewsprwire.jp/index.php/release/202404129395>. Accessed 2026-10-03.
329. BloombergNEF, press release, battery pack prices average \$156/kWh in 2019, 2019-12-03. <https://about.bnef.com/insights/clean-energy/battery-pack-prices-fall-as-market-ramps-up-with-market-average-at-156-kwh-in-2019/>. Accessed 2026-10-03.
330. Lazard, Levelized Cost of Storage Analysis, Version 4.0, 2018. <https://lazard.com/media/sckbar5m/lazards-levelized-cost-of-storage-version-40-vfinal.pdf>. Accessed 2026-10-03.
331. Tesla, Megapack 2 XL Datasheet (copy filed with Connecticut Siting Council petition 1607). https://portal.ct.gov/-/media/csc/3_petitions-medialibrary/petitions_medialibrary/mediapetitionnos1601-1700/pe1607/petition

ersubmissions/supplement-attachment-a---megapack_2_xl_datasheet.pdf. Accessed 2026-10-03.

332. ESS News, "Battery storage costs up 27% since 2020, says Lazard," 2026-07-13. <https://www.ess-news.com/2026/07/13/battery-storage-costs-up-27-since-2020-says-lazard/>. Accessed 2026-10-03.

333. New Atlas, World first energy storage unit demonstrates zero degradation over 5 years (CATL TENER, 15,000 cycles), April 2024 (press). <https://newatlas.com/energy/catl-tener-energy-storage-system/>. Accessed 2026-10-03.

334. ESS News, CATL unveils 587 Ah battery energy storage cell (also reports Gotion's 12,000-cycle product), April 16, 2025 (press). <https://www.ess-news.com/?p=4876>. Accessed 2026-10-03.



Energy Contracts to Finance Public Batteries. Gaiergy Corp. October 2026.