FOR TELECOM OPERATORS AND TOWER COMPANIES

Beyond Batteries and Generators

The case for behind-the-meter energy storage at telecom sites: whole-site backup that also earns money every day the grid stays up.

SCALABLE TO EVERY SITE

32–550 kWh

with 18–200 kW power options, matched to each site's load

Executive summary

Most telecom sites rely on two technologies designed decades ago: a -48 VDC battery string that bridges a few hours, and a diesel or propane generator for longer outages. Both sit idle more than 99% of the time, cost money to maintain, and earn nothing.

A **behind-the-meter (BTM) battery energy storage system (BESS)**, installed between the utility meter and the site's AC panel, backs up the entire site in milliseconds. The rest of the time, it lowers energy bills and earns grid revenue.

> 99%
of the time, traditional backup sits idle

Milliseconds
to whole-site backup, vs. 10–30+ s for a generator

8–60+ hrs
of whole-site runtime, depending on system size and site load

10–15+ yrs
LFP service life, vs. ~4–6 for lead-acid

Six advantages for operators and TowerCos

01 · RESILIENCY
Whole-site backup
Carries the full AC load, including cooling, which a DC string cannot, for hours to a day or more.

02 · CLEAN BACKUP
Instant and quiet
No start-up delay or failure-to-start risk. No fuel deliveries, noise or exhaust complaints.

03 · LOWER OPEX
Savings every day
Time-of-use shifting and demand response cut energy bills, not only during outages.

04 · NEW REVENUE
Grid programs
Aggregated across a fleet, batteries can earn in utility programs and wholesale markets.

05 · FEWER TRUCK ROLLS
Simpler operations
Less generator maintenance, no refueling or fuel theft, and 24/7 remote monitoring.

06 · FOR TOWERCOS
A new service line
Backup- and power-as-a-service turn sites you own into recurring revenue.

The recommended path

STEP 1 · KEEP
A small DC battery for ride-through, so radios work as before

STEP 2 · ADD
A BTM BESS as the site's main backup and energy asset

STEP 3 · RIGHT-SIZE
Downsize or retire the generator, based on each site's outage risk

THE PROBLEM

Today's backup was built for a world that's gone

The DC battery plant and the standby generator were designed for short, rare outages and cheap, flat-rate power. They cost money every year but deliver value only during outages.

The DC battery plant

Powers the radios on the -48 VDC bus

- **Protects only the radios.** HVAC, lighting and AC tenant equipment go dark, so shelters heat up and radios may shut down before the batteries run out.
- **2–8 hours** of runtime, shared by every DC load on the plant.
- **Lead-acid strings** last only 4–6 years and can't be cycled daily to save energy.
- **Duplicated:** often one plant per tenant, multiplying cost and space.

The standby generator

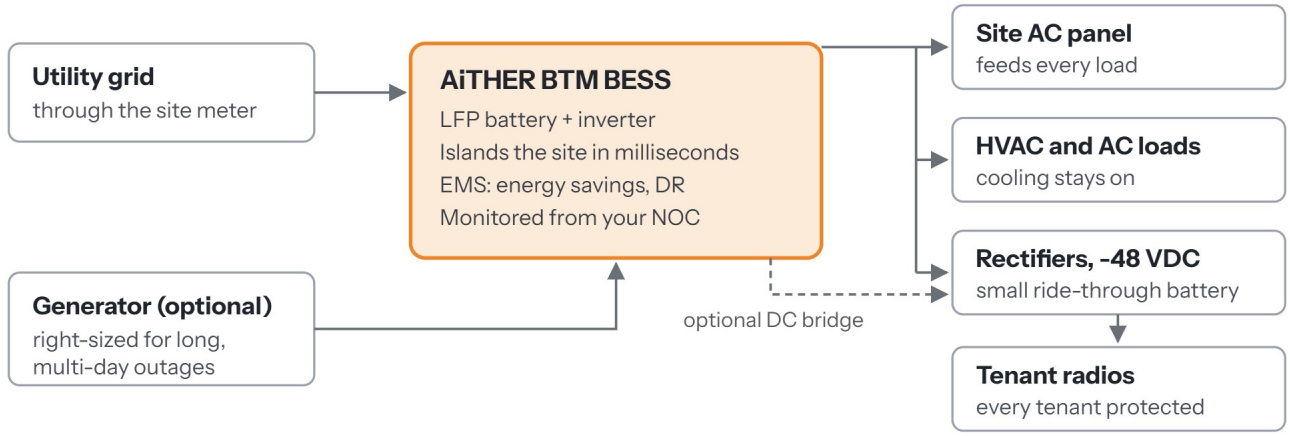
Powers the whole site, once it starts

- **10–30+ seconds** to start and transfer, so it always needs a battery to bridge the gap.
- **Can fail to start** if batteries, fuel or controls are not maintained, and the risk of failure grows the longer an outage lasts.
- **Fuel deliveries** are hardest when roads are blocked or demand spikes; fuel theft is a recurring cost.
- **Constant upkeep** (monthly test runs under NFPA 110, oil, filters, load tests) and tightening emissions, noise and permit rules.

THE SOLUTION

What a BTM BESS is

A battery system on the customer side of the utility meter that protects and manages **everything on the site**, not just one tenant's radios. Existing rectifiers and a small DC battery stay in place, so radios are powered exactly as they are today.



One BTM BESS sits between the meter and every load on the site.

LFP battery

Sized to each site's backup and energy goals: 32 to 550 kWh, with 18 to 200 kW power options.

Inverter and transfer controls

Disconnects from the grid and powers the site on its own (islanding) within milliseconds, then reconnects when the grid returns.

Energy management system

Keeps a backup reserve, schedules daily charging for savings, responds to utility and market signals, and reports to your NOC.

SIDE BY SIDE

The only option that protects the whole site instantly and earns when the grid is up

	DC battery plant	Standby generator	BTM BESS (LFP)
Loads protected	Radios (DC) only	Whole site, after start-up	**Whole site, including HVAC**
Switchover	Instant	~10–30+ seconds	**Milliseconds**
Runtime	~2–8 hours	Days, if fuel arrives	**~8–60+ hours by size; unlimited with solar or a generator**
Reliability	Undetected cell failures	Failure to start, fuel quality	**Monitored 24/7; faults flagged before outages**
Fuel, emissions, noise	None	Deliveries, exhaust, noise	**None**
Maintenance	Inspections and testing	Test runs, oil, filters, load tests	**Mostly remote; periodic inspection**
Service life	~4–6 years (lead-acid)	Long, with overhauls	**~10–15+ years (LFP)**
Value when grid is up	None	None	**Energy savings and grid revenue**
Permitting	Simple	Air quality, noise, fuel storage	**Electrical and fire code (UL 9540, NFPA 855)**

RESILIENCY

From “will the generator start?” to “how many hours do we want?”

Illustrative whole-site runtime*

System	1 tenant (8 kW)	3 tenants (20 kW)
185 kWh	~21 h	~8 h
370 kWh	~42 h	~17 h
550 kWh	~62 h	~25 h

Ready before the storm: ahead of severe weather or utility shutoffs, the EMS pauses daily savings and fills the battery.

Battery + generator for multi-day outages

- **Battery first.** The generator starts only if an outage outlasts the battery.
- **Less fuel.** It runs at full load just to recharge the battery, then shuts off.
- **Recoverable failures.** If the generator doesn't start, the battery's remaining hours give technicians time to respond.
- **Smaller or none.** Generators can be downsized, shared across tenants or removed at low-risk sites.

Emissions rules keep tightening

Federal EPA rules generally limit emergency diesel engines to 100 hours a year of testing and maintenance; California generally allows 50, and local air districts and noise ordinances add more. A battery has no on-site emissions or noise.

A clear permitting path

A battery replaces air-quality and fuel-storage permits with electrical and fire-code review. UL 9540-listed LFP systems with UL 9540A test data, installed to NFPA 855, give local authorities a well-understood path to approval.

*90% usable capacity, full battery reserved for backup, constant load. On days when the battery also earns savings, the EMS holds a backup reserve (e.g., 60–80% of capacity), so guaranteed runtime is proportionally lower.

ENERGY VALUE

Earning on the days the grid stays up

Because the battery sits on the AC side, it can lower the **whole site's bill**, including HVAC and every tenant. Illustrative values for a 370 kWh system at a multi-tenant site:

Value stream	How it works	Per site, per year*
Time-of-use (TOU) arbitrage	Charge off-peak and run the site on the battery on-peak: ~200 kWh shifted daily at a ~$0.02–0.09/kWh net price spread	~$1,500–6,300
Demand response	Get paid to lower grid use during utility or aggregator events	Often ~$50–150 per kW-year
Wholesale markets	A fleet sells energy and grid services in markets like CAISO, ERCOT, PJM and NYISO	Market-dependent

Fleets earn more. One site is too small for most programs, but hundreds of sites run by one EMS act as a virtual power plant. FERC Order 2222 opens wholesale markets to these fleets, rolling out by market:

CAISO	ISO-NE	NYISO	PJM	MISO	SPP
Live since 2024	Live since 2024	Full by end-2026	Feb 2028	Targeted 2029	Expected ~2030

What it means for TowerCos

site power becomes a revenue line, not a pass-through cost

Backup-as-a-service
Own a shared battery and sell guaranteed backup hours to tenants.
+ Recurring fee per tenant

Power-as-a-service
Supply metered power to tenants and manage the site's energy.
+ Margin on managed energy

Savings share
Run the battery for energy savings and share them with tenants.
+ Share of savings

Grid services
Enroll the fleet in utility programs and wholesale markets.
+ New revenue from existing sites

One shared battery also replaces duplicated tenant battery plants and generators, freeing ground space you can lease and making new tenant installs faster.

Getting deployment right

- **Sizing:** start from 12 months of load, outage and tariff data. A 370 kWh system recharges in ~4–5 hours at 100 kW, versus nearly a day at 18 kW.
- **Grid connection:** UL 1741 SB / IEEE 1547 inverters; non-export setups usually get approved faster.
- **Generator logic:** the battery leads and the generator recharges it, with clear rules for low fuel and faults.
- **Fair tenant billing:** submetering splits energy, savings and backup costs. Start with high-outage, high-tariff or problem-generator sites.

Solar and incentives. Where there's room, solar charges the battery and extends outage runtime indefinitely on sunny days. Federal storage tax credits and state programs such as California's SGIP can materially lower net cost (eligibility confirmed per project).

*Illustrative ranges; actual results depend on tariff, load profile, market and program participation.

LFP in every product
UL 1973 / 9540 passed, UL 9540A tested, built to NFPA 855

Right-sized systems
32–550 kWh and 18–200 kW, matched to each site

In-house EMS
Backup reserve, energy savings and fleet monitoring

Flexible models
Purchase, backup-as-a-service or power-as-a-service

Next step: a fleet plan for 20–50 of your sites

Share load, tariff and outage data → a site-by-site plan for backup, savings and generators

info@aithersystems.com
888-556-6042 · AitherSystems.com