



SUNSPEC
— ALLIANCE —

alkitech

Unlocking Grid Capacity: Utility Blueprint for Seamless Battery Storage Integration

Real-world strategies for integrating battery storage and DERs with DERMS, SCADA, and utility operations using open standards.



August 6, 2026



9:00 AM PST
12:00 PM EST



Live Webinar



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Agenda

1. **DER & Battery Growth : Setting the context**
2. **ASE Solution : DER Gateway & Aggregator Platform**
3. **How IEEE2030.5 helps**
4. **5 years of Rule21/COT / FlexConnect/ NWA Experience**
5. **PG&E DIDF in the Field : White Pine Renewables**
6. **DER Onboarding & Integration Process**
7. **Lessons Learned**
8. **Cybersecurity & PKI Flexibility**

Today's Panelists



Joe McLean

**Executive Vice President of
Technology and Business
Development**

Joe McLean leads Technology at White Pine, responsible for origination, strategy, procurement and engineering of White Pine's standalone storage and solar plus storage projects plus corporate strategy, policy and analytics.



Former Director of Energy Storage at TotalEnergies (formerly SunPower C&I Solutions) with 7+ years of experience advancing over 600MWh of distributed energy storage systems.



Joe Paul

**Lead Consultant
Applied Systems Engineering /
Kalkitech**

Joe Paul is a Lead Consultant at ASE/Kalkitech with over 15 years of experience in Distributed Energy Resource (DER) integration and SCADA systems. He specializes in enabling seamless interoperability between DERs and utility platforms, guiding customers through protocol implementation, utility compliance, and testing requirements.



Expert in IEEE 2030.5, SunSpec Modbus, and other industry standards with a proven track record leading successful DER integration projects for reliable, standards-compliant grid connectivity.

White Pine Renewables : Introduction

White Pine Renewables is a full-service solar and battery energy storage development company, primarily serving city, industrial, agricultural, municipal, and commercial customers with on-site energy solutions.

Prior to founding White Pine in 2020, the White Pine team established a combined 20+ year track record of experience in the solar industry, having successfully contracted, developed, financed, and constructed 2+ GW of solar and storage projects.

While having done projects around the country, White Pine mainly focuses on California, where it has delivered some of the most innovative projects in the state including the largest floating solar project in the country, multiple distribution deferral projects for utilities, and the largest disadvantaged community solar project.





Kalkitech / ASE enables the digitization of utilities and renewables integrating control, compute and communication.

We enable customers to implement mission critical applications from edge to SCADA/ADMS/DERMS or Cloud.

In 2014, Kalkitech acquired ASE, a protocol technology leader, and a leading manufacturer of RTU/IED protocol test equipment for the SCADA Industry.

1000+



Customers

70+

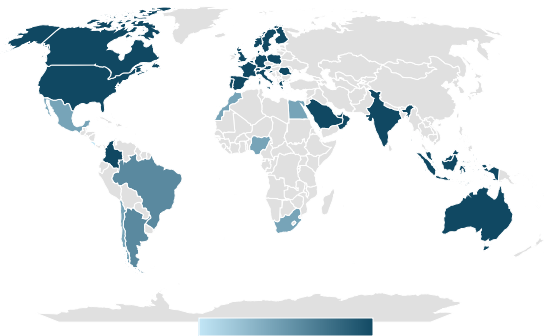


Countries

20+



Partners



Organization

44+ Years

Affiliations



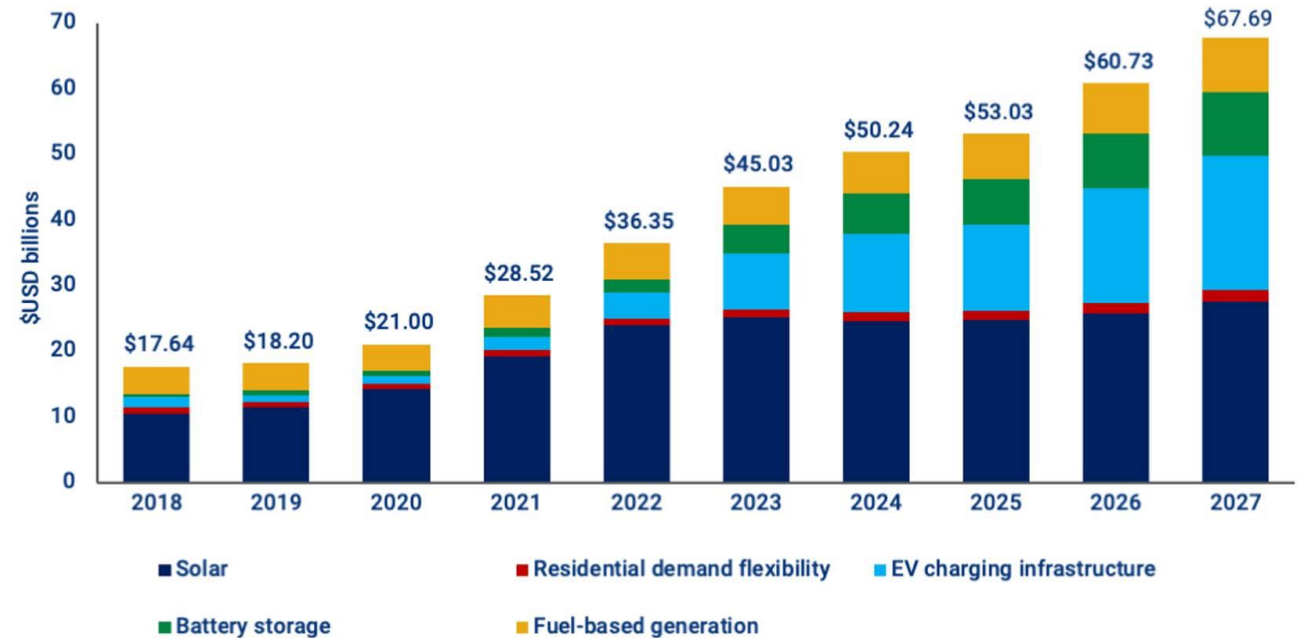
DER & Battery Growth: Setting the Context

Distribution grids are being reshaped by rapid growth in distributed energy resources (DERs), electrification, and behind-the-meter (BTM) storage — creating both a challenge and an opportunity for utilities.

What's driving DER growth in the US?

- **Grid Reliability Challenges:** Increasing grid instability is accelerating investments in DERs and resilient energy systems.
- **Interconnection Delays:** Slow and costly ISO/RTO interconnection processes are driving utilities and enterprises toward DERs and demand flexibility solutions.
- **Government Incentives:** Federal programs (IRA tax credits, NEVI grants) and state-level incentives are significantly reducing the cost of DER adoption.
- **Rapid Market Growth:** Strong policy support and energy resilience needs are also fuelling exponential growth in DERs across the U.S.

The US DER market will nearly double from 2022 to 2027, reaching US\$68 billion per year



Source: Wood Mackenzie Grid Edge, US Distributed Solar and Energy Storage Service

How ASE / Kalkitech Helps



Utilities don't need another point solution — they need a standards-based bridge between field devices, aggregators, DERMS, and market operations that scales across programs and years.

Bridging IT & OT



Secure, standards-based connectivity linking field devices, master aggregators, DERMS, SCADA, and enterprise systems.

Standards-First



Deep, certified expertise in IEEE 2030.5 (CSIP), SunSpec Modbus and DNP3 — not proprietary lock-in.

DERMS / Cloud Agnostic



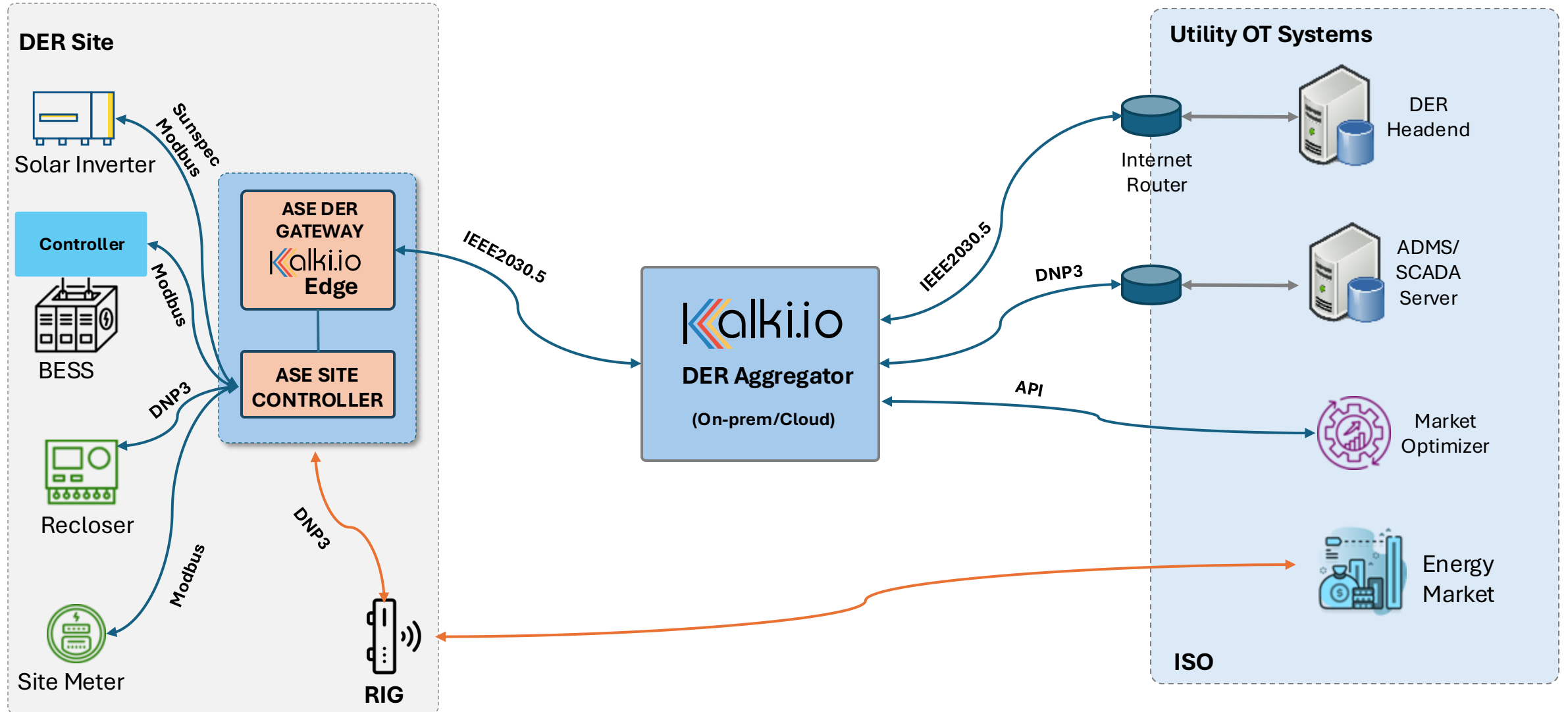
Works with any DERMS, ADMS, or cloud platform — deployable on Azure, AWS, or fully on-premise.

Proven at Utility Scale

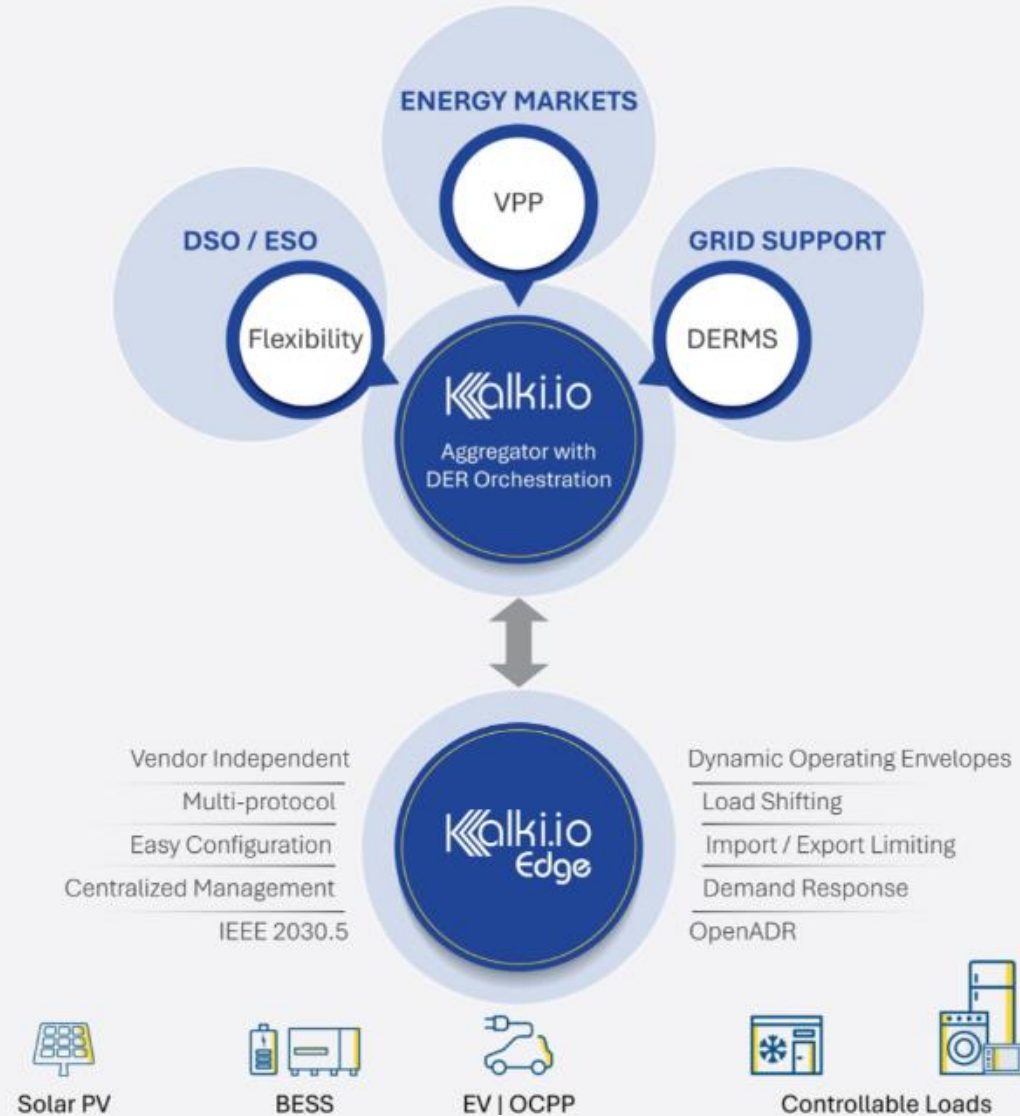


5+ years supporting California Rule 21, Flexible Interconnection and Non-Wires Alternative programs.

ASE Solution : DER Gateway & Aggregation Platform



Kalki.io DER Orchestration



How IEEE2030.5 helps

- A standardized, secure client-server protocol (Common Smart Inverter Profile — CSIP) for utility-to-DER communication
- Enables day-ahead schedules, real-time controls, telemetry and event notifications over a single, certified interface
- Removes the need for custom, point-to-point integration between every DER vendor and every utility system
- Backed by SunSpec Alliance certification & conformance testing — giving utilities confidence in interoperability

Why It Matters for DIDF

- ✓ Secure day-ahead & real-time dispatch of front-of-meter BESS
- ✓ Consistent telemetry for utility DERMS forecasting
- ✓ Vendor-neutral: works across BESS OEMs (e.g. Tesla) via SunSpec Modbus mapping
- ✓ Faster commissioning — proven architecture reused across sites

Cybersecurity & PKI Flexibility



- SunSpec-approved PKI simplifies secure onboarding out-of-the-box for standard IEEE 2030.5 deployments
- Full flexibility to integrate a utility's own PKI / certificate authority where specific security policies require it
- Mutual TLS authentication between gateway, aggregator, and DERMS endpoints. TLS 1.2/1.3 with a restricted cipher suite matching IEEE 2030.5 security profile is used.
- Secure remote access and audit logging across the device, gateway and cloud/on-prem layers
- Hardware root of trust (TPM) at the gateway protects private keys and supports secure boot — prevents firmware tampering at the physical layer.
- Aggregator typically sits in its own segmented network zone, isolating DER/OT traffic from the WAN and from enterprise IT rather than exposing gateways directly.
- Defense-in-depth architecture designed to satisfy utility OT security and NERC CIP-adjacent expectations

5 Years of Rule 21 / Flex Connect / NWA Experience

Since 2021, Kalkitech / ASE's DER gateway and IEEE 2030.5 aggregation technology has supported California utility Rule 21 Smart Inverter, Flexible Interconnection, and Non-Wires Alternative (NWA) programs.

2021	2022–23	2023–24	2024–25	2025–26
• Lab pilot of Rule 21 at PG&E Lab + initial telemetry sites.	• IEEE2030.5 Aggregator testing and approval with PG&E. • Scale COT deployment	• PG&E Production deployment of Aggregator sites for telemetry. • DIDF & Flex Connect Lab testing with PG&E • SCE – COT Gateway approval testing.	• PG&E Production deployment of Flex Connect Sites. • IEEE2030.5 Aggregator testing with SCE. • Scale production deployments to 50+ sites.	• DIDF sites + additional FlexConnect Sites. • COT sites – scaled to 100+ • Production DER deployments with SCE and SDGE Utilities.

PG&E's DIDF (Distribution Investment Deferral)

Definition

PG&E partnered with White Pine to deploy two advanced battery energy storage systems in Kern County, located in Lakeview and Blackwells Corner, that help balance electricity supply and demand on California's grid.

These projects are among the first of their kind designed specifically to defer traditional utility infrastructure upgrades.



Production Deployments

Lakeview (1.2MW)

The Lakeview battery discharges to mitigate congested feeders during certain hours in the summer months at PG&E's distribution circuit.

Because this circuit is overloaded, a flexible load interconnection was required.

This required commands to come from PG&E for discharging, but also schedules on when charging could be allowed

Blackwells Corner (2 MW)

The Blackwell's battery charges to reduce solar penetration at an overloaded substation transformer during spring months during solar hours.

Because there is too much generation at the substation, a flexible generation interconnection agreement was required.

This required commands to come from PG&E for charging, but also schedules on when discharging could be allowed

The Solution

Multiple Revenue Streams

Batteries needed to operate in the front of meter CAISO markets, doing day ahead and real time market operations

The project needed to be able to take commands from PG&E and plan around those in order to operate the batteries.

PG&E wanted to use their DERMS system and existing partners to communicate with the site.



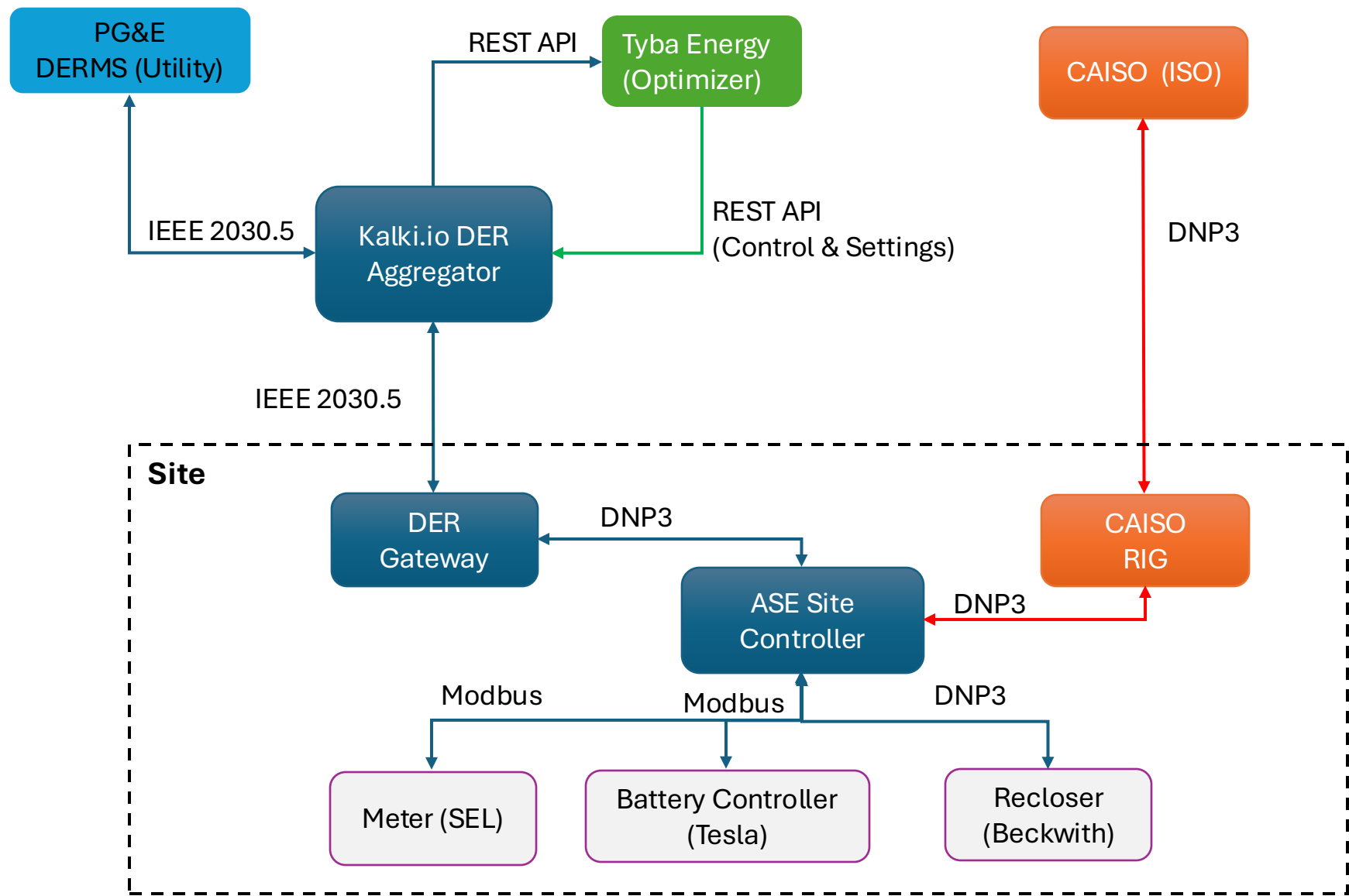
ASE Solution

ASE DER Aggregator receives the dispatch target on hourly basis as day-ahead controls which are pushed to Tyba, received from Tyba and transmitted to Site controller.

Tyba Solution

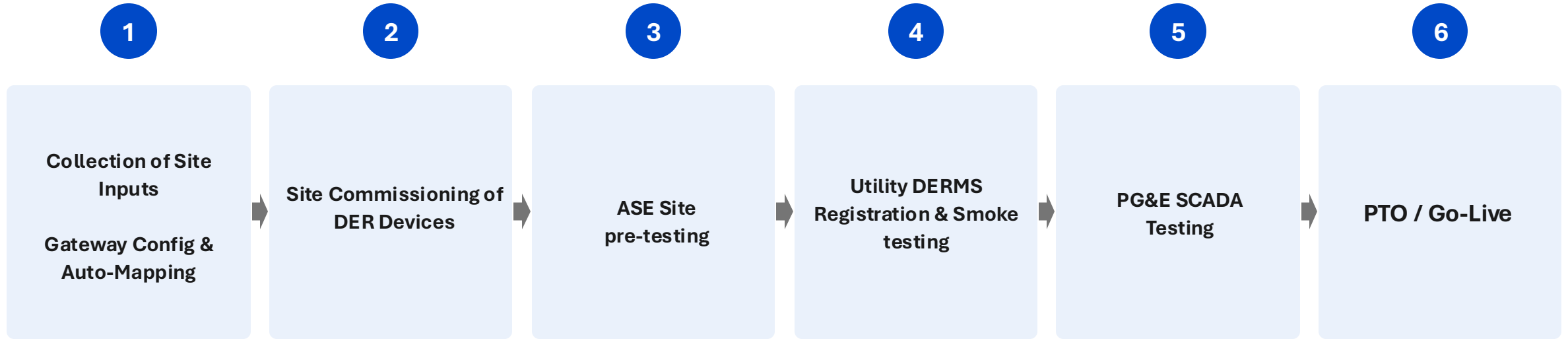
Tyba injects the dispatch target and charge/discharge limitations. Tyba creates a battery dispatch profile to maximize revenue while working within the PG&E constraints and meeting dispatch targets.

White Pine BESS Site Architecture



- PG&E day ahead dispatch commands shall be received by DER aggregator over IEEE2030.5 and this shall be passed to the DER gateway as well as send update to Tyba over REST API.
- Tyba receives the PG&E dispatch instruction and then formulates it with its own bids and offers for the California Independent System Operator (CAISO) day ahead and real-time markets. Tyba then submits these bids to CAISO through a scheduling coordinator.

DER Onboarding & Integration Process



Then: Post-Deployment Lifecycle Support

- 24/7 remote monitoring & diagnostics of DER Gateway and Aggregator health
- Proactive site engagement to minimize downtime and restore operations.
- Firmware update coordination
- Ongoing compliance & Measurement and Verification (M&V) reporting for the utility program
- Dedicated support for program changes — new tariffs, protocols, or DERMS integrations

Lessons Learned

DER Interconnection Programs



Reusable Architecture Pays Off

A standards-based architecture proven at one site (Lakeview) lets later sites (Blackwell's Corner) come online significantly faster.



Close Three-Way Coordination

Tight coordination between the Utility, DER Developer, and ASE reduces total interconnection time and drives faster go-live.



Pre-Test With DER Site

Pre-testing with the DER site ahead of time reduces rework and surprises during Utility SCADA testing.



Templatize DER Device Configs

Templatizing DER device configurations cuts configuration time and improves consistency across sites.



Align on Cyber / NERC CIP Early

Early alignment on cybersecurity and NERC CIP requirements avoids late-stage rework and schedule slips.



Centralize Runbooks & Docs

Shared commissioning checklists and runbooks speed onboarding of new ASEs and standardize go-live steps.



Thank You



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