Host Utilities

Co - Host Utilities

ORGANIZER

India Smart Grid Forum

Supporting Ministries

India SMART UTILITY Week 2024

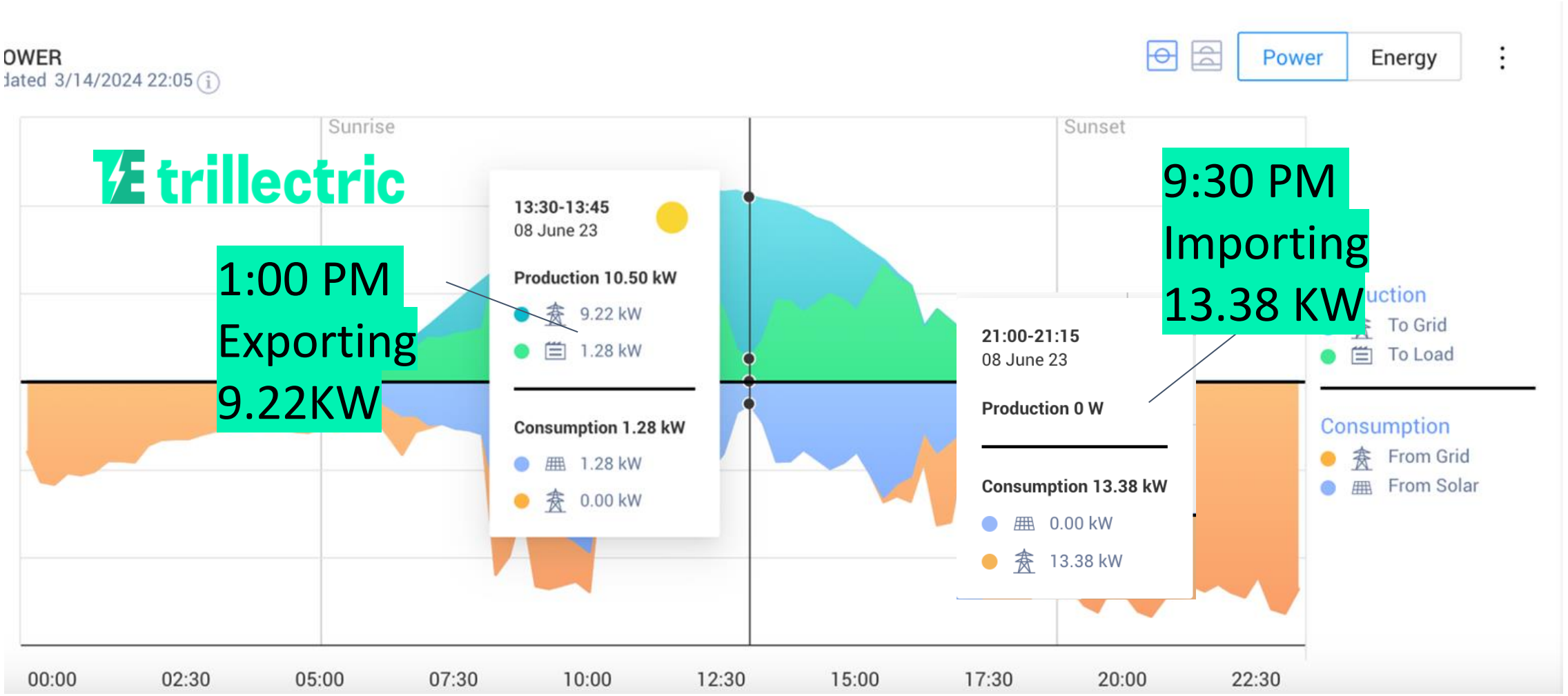
Session : Digital tools for DER Management

DERMS (DISTRIBUTED ENERGY RESOURCE MANAGEMENT SYSTEM)

Presented By

Arshi Chadha, Co-founder , M/S Trillectric Gridmend Pvt Ltd

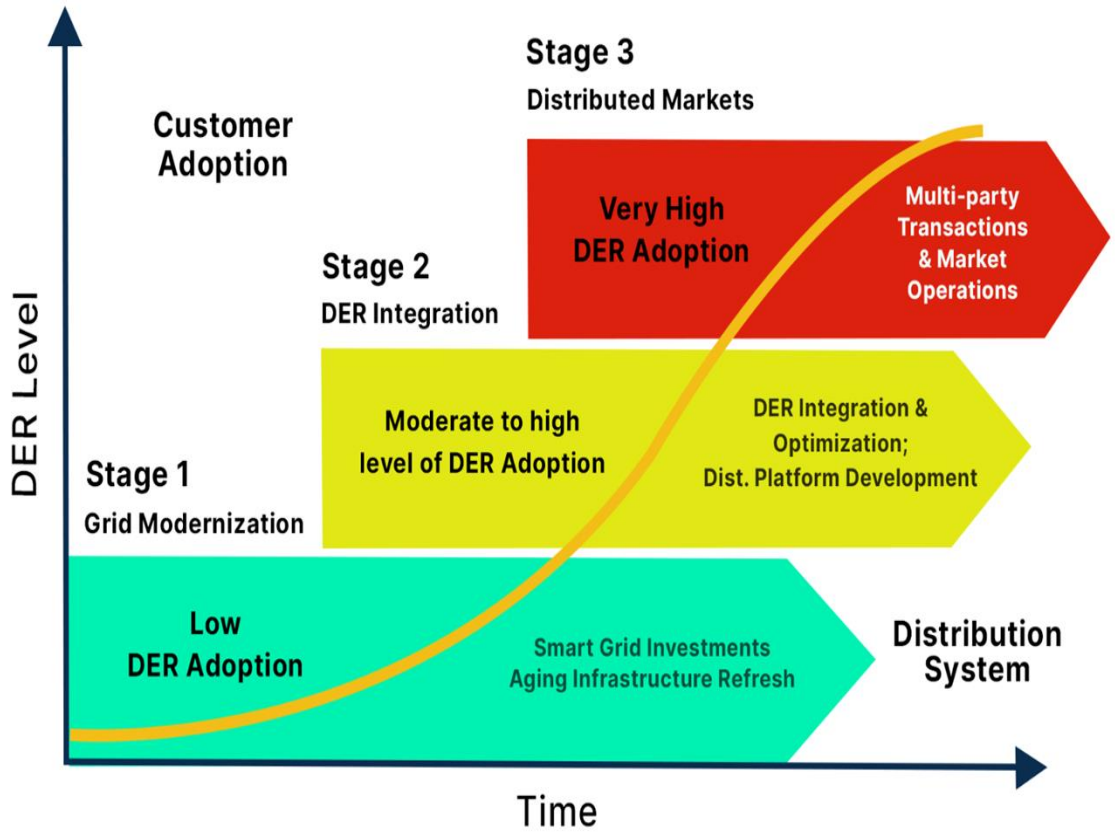
Solar Export & EV Import - 8 JUNE 2023 / Residential Consumer



DER determines the operation pattern of the power system.

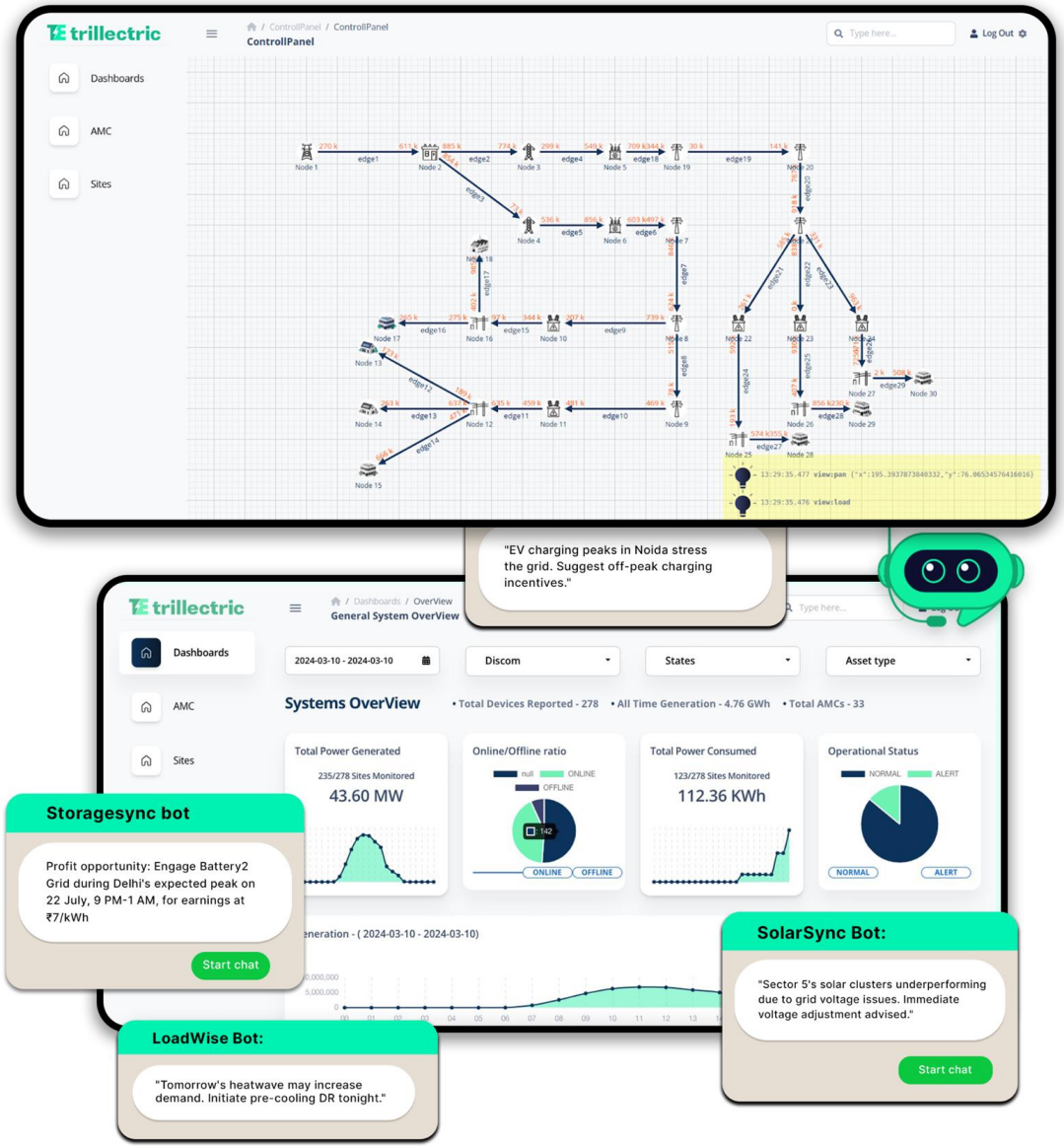
1. **Midday Overload:** Intense solar generation contributes to surplus energy, risking reverse power flow.
2. **Evening Demand Surge:** Peak EV charging from 9 PM to 1 AM strains limited nighttime capacity.
3. **Visibility Gaps:** Inadequate feeder-level insights lead to poor capacity planning and grid imbalances.
4. **Voltage Instability:** Convergent demand from diverse DERs triggers fluctuations, demanding responsive grid technologies.

(Source: Lawrence Berkeley National Laborat



Navigating India's Solar & EV Surge with DERMS

1. **Real-time Solar Integration:** Adjust solar contributions, reducing curtailment and supporting voltage regulation through precise, real-time grid feedback mechanisms.
2. **EV Charging Coordination:** Advanced algorithms to manage EV charging demands, integrating V2G capabilities for enhanced grid support during peak load conditions.
3. **Capacity & Reliability Enhancement:** Utilizes predictive analytics for capacity planning, improving grid reliability by mitigating potential disruptions from fluctuating DER inputs.
4. **Ancillary Service Facilitation:** Contribute to the grid's ancillary services, such as frequency response and reactive power support, by harnessing DER for a more resilient grid.



The Trillectric Approach - A UNIFIED DATA HIGHWAY

SOLARSYNC

Tailored solar performance management with AI-driven optimization.

SOLAR DATA LOGGER

CIRCUITMAP

Advanced network mapping for robust grid control & insights.

ENERGYINSIGHT

Actionable insights for demand response & consumer engagement.

GRIDVAULT

Battery-to-grid solutions enhancing stability and efficiency.

B2G CONTROLLER

LOADWISE

Smart load tracking with detailed consumption analytics.

ENERGY MONITOR

Trillectric Framework: Integrating Technology for Smarter Grids

Agnostic System Compatibility

Seamlessly interfaces with diverse energy management systems.

Provides a single access point for comprehensive control.

Enhanced visibility for actionable intelligence.

Ensures unified operations, optimizing impact across the grid.

Building of Data Highways

Enables real-time interconnectivity among various data points.

Facilitates custom metrics and analytics for precise energy tracking.

Maintains both historical and real-time data for accurate forecasting.

Allows definition and computation of advanced energy metrics.

Monitor, Analyse, Process, Predict and Alert

Integrates existing AI and algorithms for centralized analytics.

Provides advanced profiling and predictive insights.

Enables visualized control over energy nodes and metrics.

Generates alerts for proactive management & threshold-based actions.

Equipment Control Flexibility

Allows both manual and automated control of connected assets.

Employs advanced rules for alarm-triggered equipment responses.

Facilitates both ADR and BDR programs through intelligent system design.

Integrates signals from other systems for a coherent control experience.

Cost-Effective & Secure Infrastructure

Offers a fleet of cost-effective hardware designed for large-scale deployment.

Combines advanced role-based access with object-level controls for security.

Incorporates the latest technology for scalable and efficient operations.

Utilizes chatbots and LLMs trained in-house for responsive data management.

Trillectric's Sector Synergy: Driving Energy Innovation Forward

Manufacturers

Streamlined IOT integration for device management.

Enhanced monitoring and control with white-label solutions.

Advanced analytics for solar inverters and related equipment.

DISCOMs

Unified data platform for comprehensive grid oversight.

Predictive tools for load management & anomaly detection.

Custom reporting for performance optimization and EMI management.

DR Aggregators

Platform for efficient Demand Response (DR) program execution.

Advanced Demand Response (ADR) capabilities for user flexibility.

User-friendly onboarding and engagement through AI bots.

Institutions

Consolidated data analysis and algorithmic model testing.

Time-series data handling for in-depth energy pattern analysis.

A/B testing for algorithm optimization & reporting accuracy.

DER Lenders

Customer generation tracking for performance benchmarking.

Default alerts tied to generation performance to secure investments.

Behavior-based EMI default minimization strategies.

EV Bus Fleet Operators (Labs)

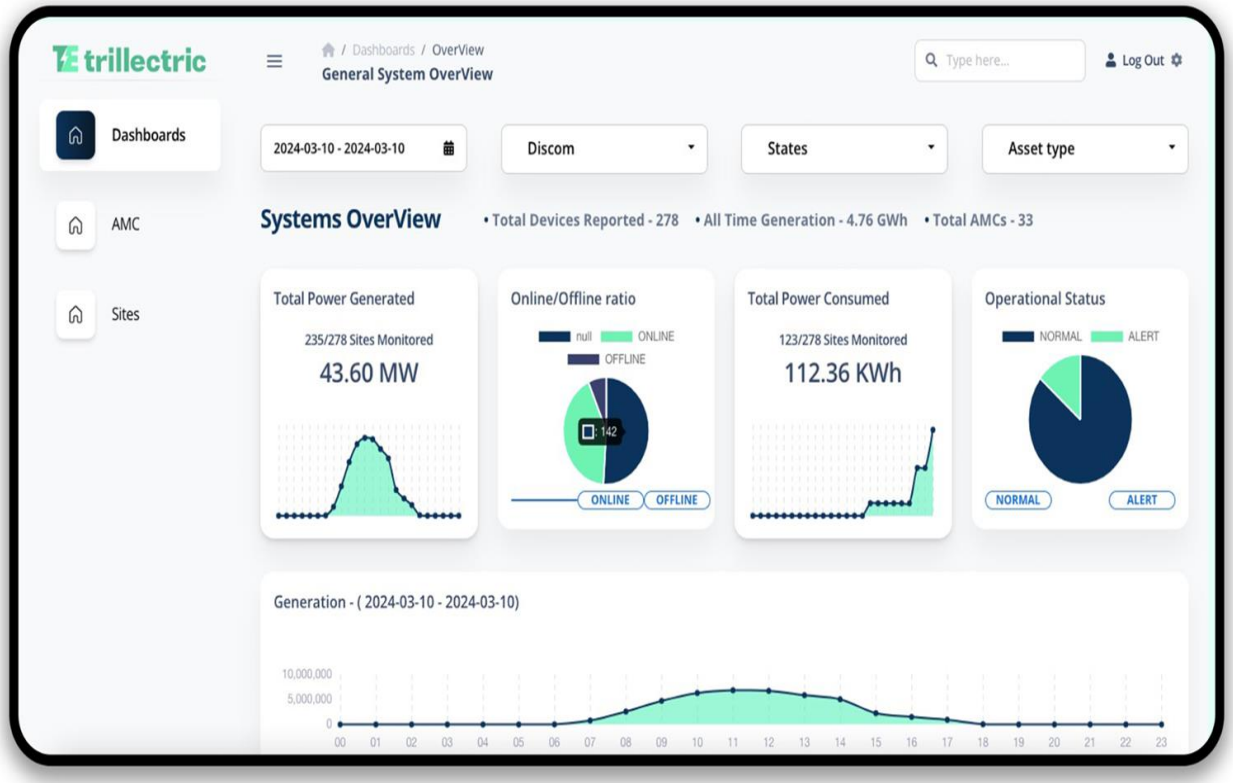
Penalty minimization through real-time charging oversight.

Delayed arrival alerts and Discom peak shaving for cost-effective operations.

Depot scheduling and utilization analytics for optimal charging.

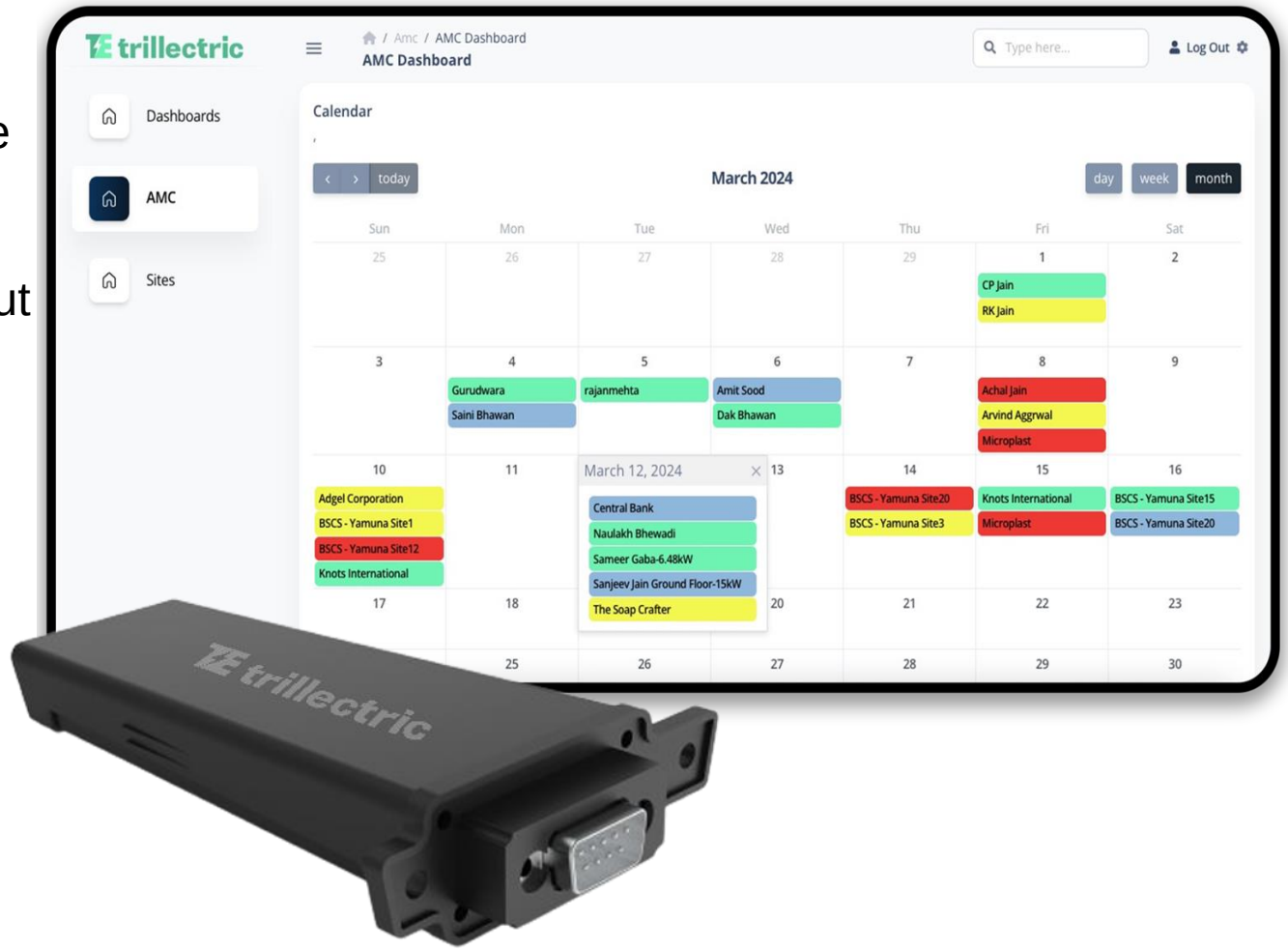
USE CASE - DER Lenders - Banks/NBFC

1. **Investment Security:** Leverage DERMS to protect assets, ensuring long-term profitability of funded projects.
2. **Credit Risk Assessment:** Use performance data to evaluate and manage loan risks effectively.
3. **Regulatory Compliance:** Ensure funded projects adhere to evolving energy regulations and standards.
4. **Portfolio Optimization:** Utilize DER analytics for strategic lending and investment in high-yield energy projects.



USE CASE - Solar Maintenance

1. **Predictive Maintenance:** Implement AI to predict and preemptively address maintenance needs, minimizing downtime.
2. **Performance Analytics:** Monitor energy output to ensure each solar panel operates at peak efficiency.
3. **Remote Diagnostics:** Utilize IoT for real-time system health checks and rapid issue resolution.
4. **Cost Reduction:** Lower maintenance costs through optimized scheduling and resource allocation.



THANK YOU

trillectric

Please visit us at BOOTH 9

For discussions/suggestions/queries email:

Arshi@Trillectric.com

visit: www.trillectric.com