

High-Performance Microgrids, DERMS, and the Changing Future of Grid Controls

PXiSE Energy Solutions

Speakers



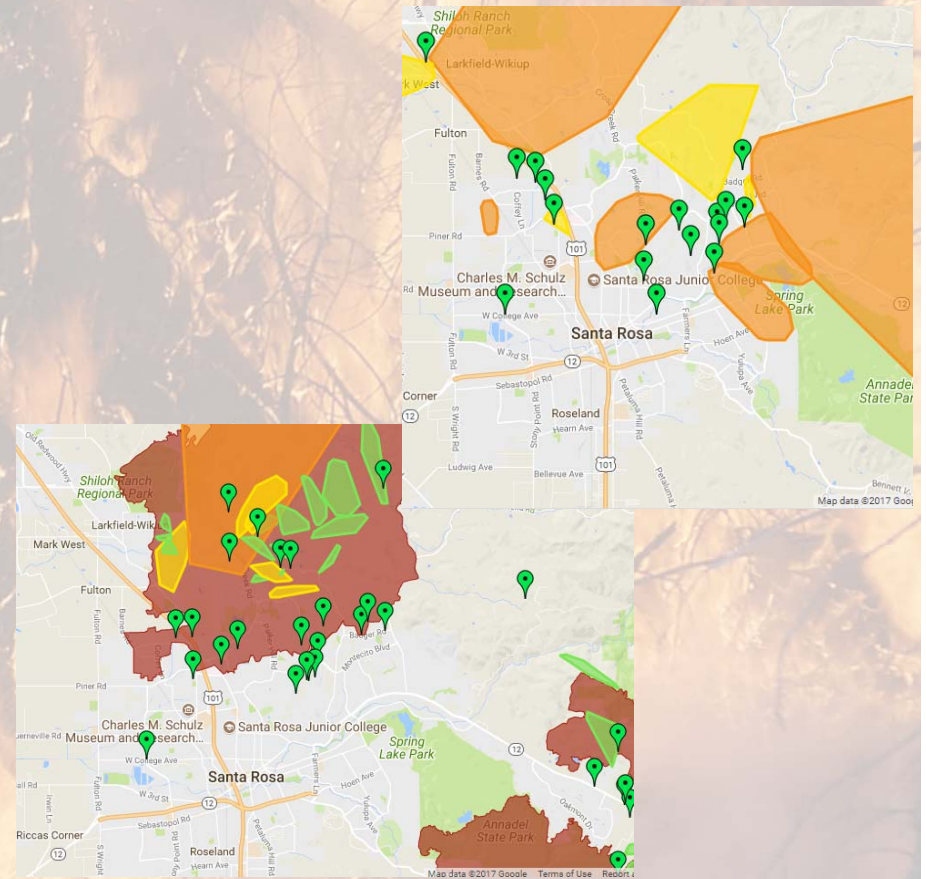
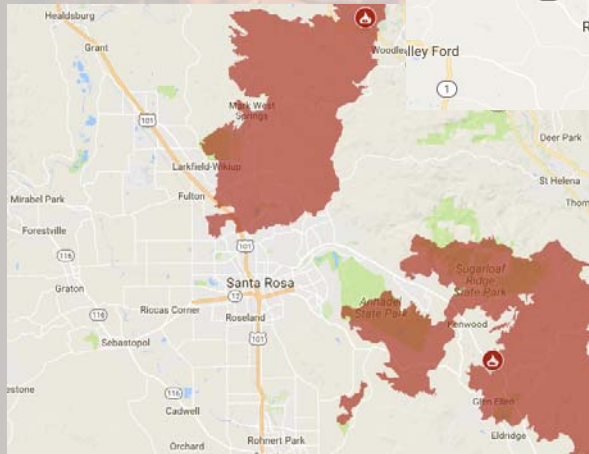
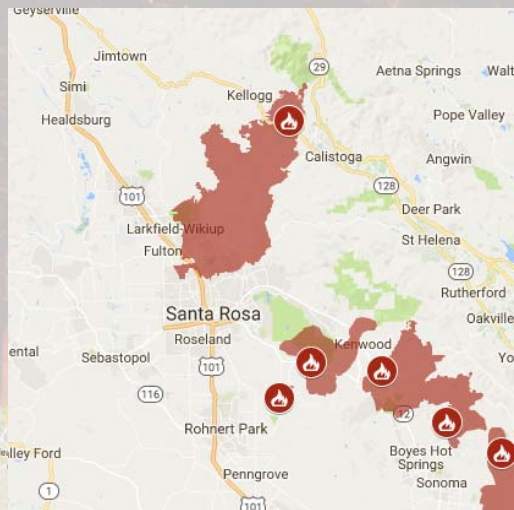
PATRICK LEE
CEO, PXISE ENERGY SOLUTIONS



DAVID LIEBMAN
ENERGY & SUSTAINABILITY MANAGER,
SONOMA COUNTY JUNIOR COLLEGE DISTRICT

Recent Natural Disasters

Population Affected





Santa Rosa Junior College Urban Microgrid

Pairing renewables with
resilience on a campus

Ambitious Campus Goals

Establishing a
Culture of
Sustainability

Zero Net Energy
District Source
by 2030
(across building portfolio)

Carbon Neutral
Operations by
2030

Zero Net Non-
Potable Water by
2030

Urban Microgrid Project Objectives

GHG Emissions Reductions

- Demonstrate how a microgrid can help drive GHG emissions reductions

Operational Savings (utility expense & labor)

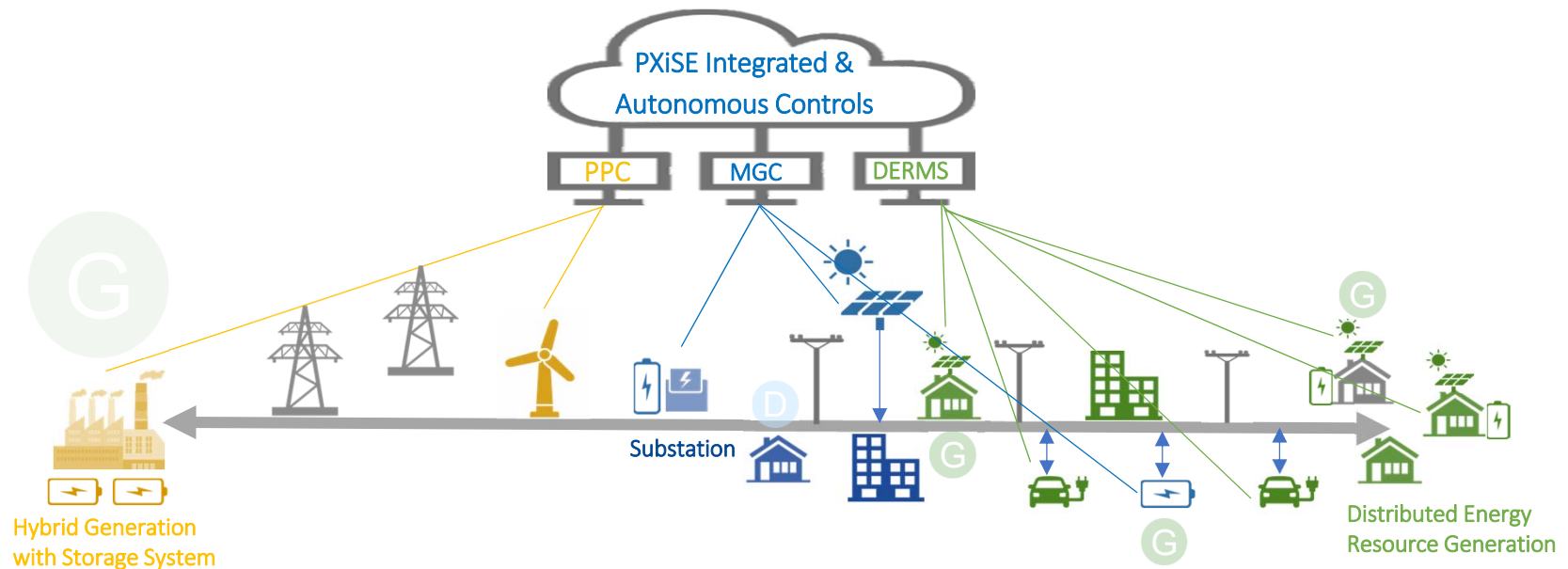
- Explore and test value streams for microgrids
- Test the business case for advanced microgrids for California Community Colleges

Resiliency, Reliability, & Power Quality

- Develop a model for flexible and adaptable systems
- Provide educational resource for future trade education programs
- Improve and support organizational / academic continuance

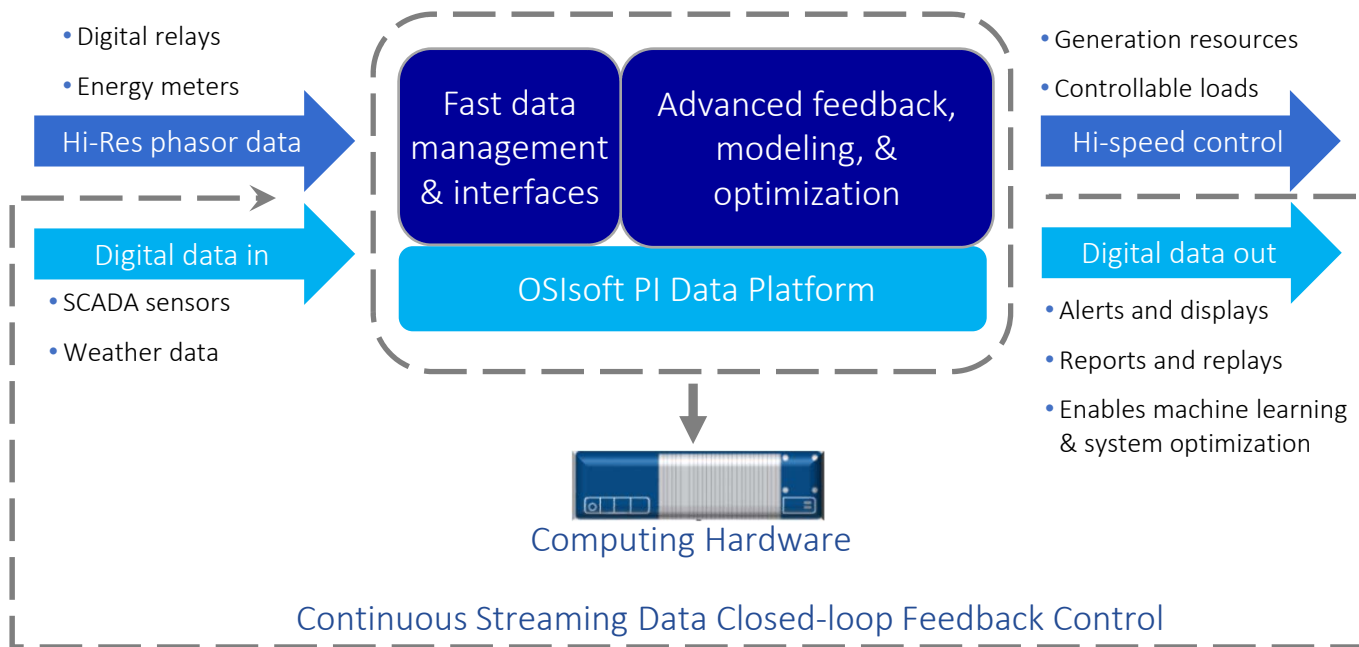
A Changing Grid Requires New Solutions

Advanced Controls enable renewable integration and provide resiliency, reliability and cost savings



The Foundation of PXiSE Control Architecture

Orchestration of DER to Deliver Affordable and Reliable Power



PXiSE ACT

One Platform, Many Solutions

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DER Control

Realize savings with peak shaving, demand response, and grid services



Renewable Power Plant Control

Ensure resilience and optimal power quality



Microgrid Controller

Reduce integration costs and boost revenue



Distributed Energy Resource Management (DERMS)

Maximize system efficiency and reliability





Microgrid Configuration

Existing Infrastructure

- 5 Feeders owned by SRJC, single point of interconnection w/ PG&E
- 218kW PV in 2 locations
- Backup DG
- Thermal Energy Storage
- Total site load: 800kW to 2.6MW

Capital Improvements

- Demo 2 Buildings and unpermitted PV
- Construction of 2 new structures
- New Central Plant with 600kW electric boiler

Proposed Grant Additions

- 2MW, 2MWh additional storage in 2 locations
- Microgrid control (PXiSE) of DERs
- Intelligent load management & submetering
- Active feeder interconnection
- Integration with HVAC EMS for DR and load enable

Installed DERs

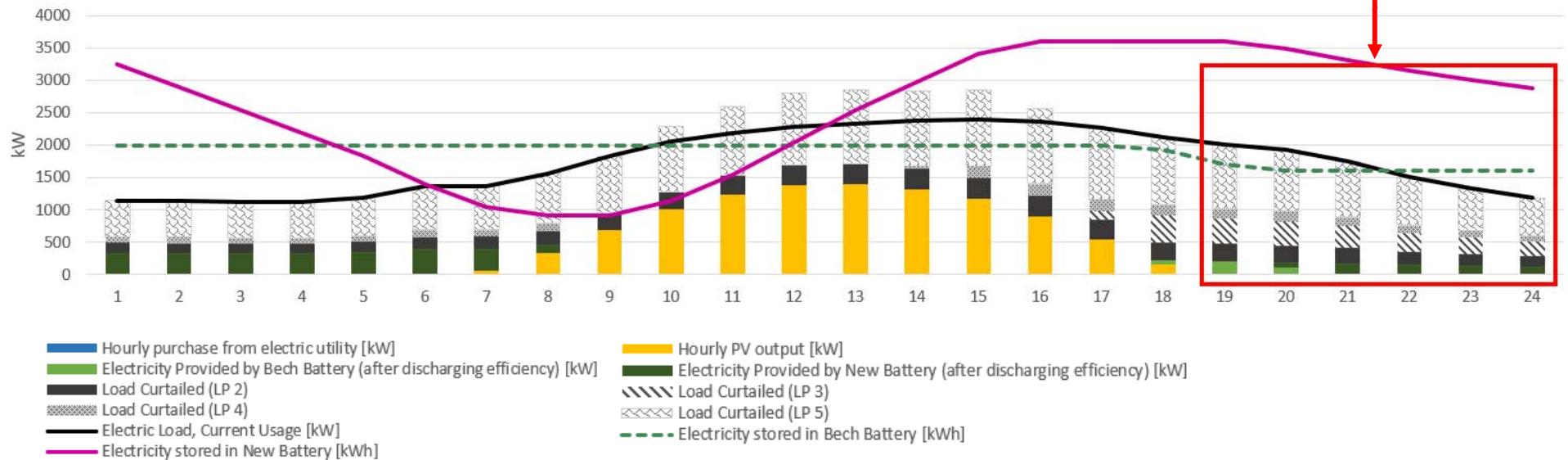
- 2.5MW of PV, distributed on 3 feeders
- 1MW, 2MWh energy storage on feeder 3

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Resiliency Dispatch

September Outage with Curtailment

5 Weekdays, LP 2-5 allowed to curtail 5.6 MWh Storage

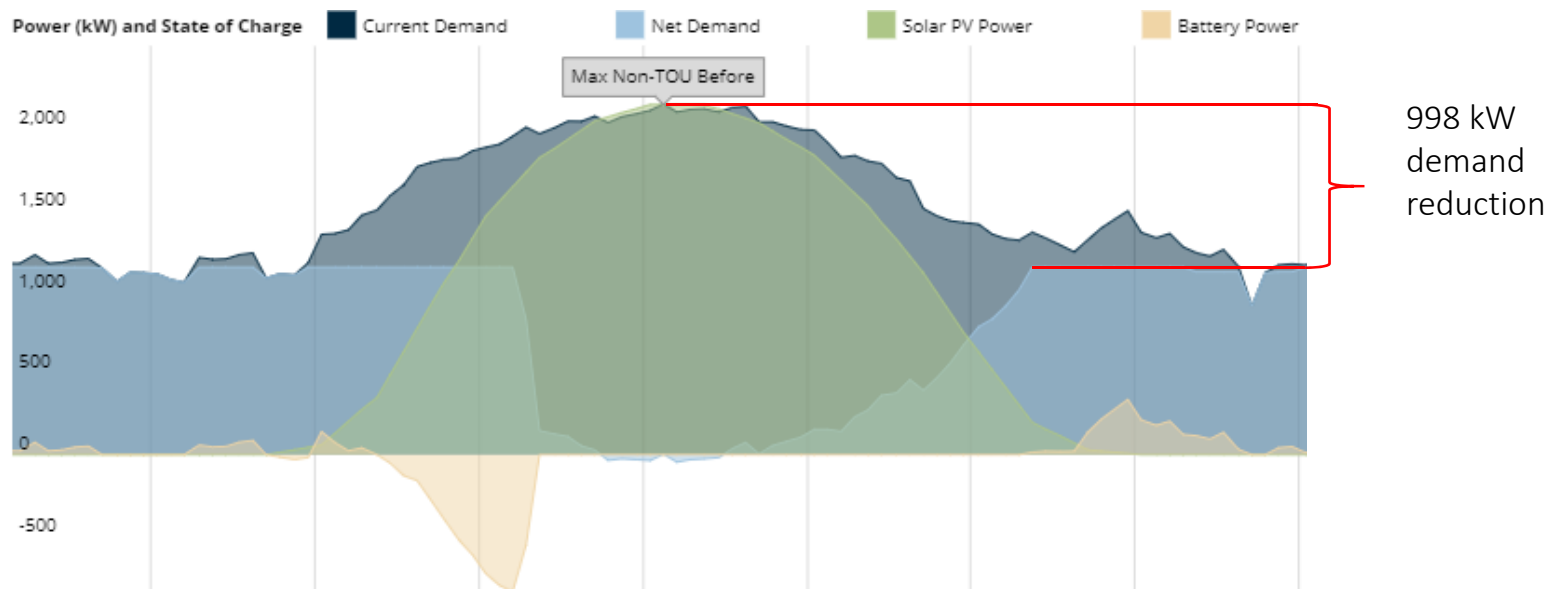


SRJC Microgrid Concept One-Line
2017-11-08



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Solar + Storage Solution at SRJC



- Expected Solar Production: ~4 GWh / year
 - ~36% offset of total campus kWh energy use
- Expected Energy Savings: \$330K / year
- Expected Demand Savings: \$170K / year
- Expected Demand Response Revenue: \$50K / year

The Key to Meeting Ambitious Campus Goals

GHG Emissions
Reductions

Operational Savings
(utility expense & labor)

Resiliency, Reliability,
& Power Quality



Zero Net Energy
District Source
by 2030

(across building portfolio)

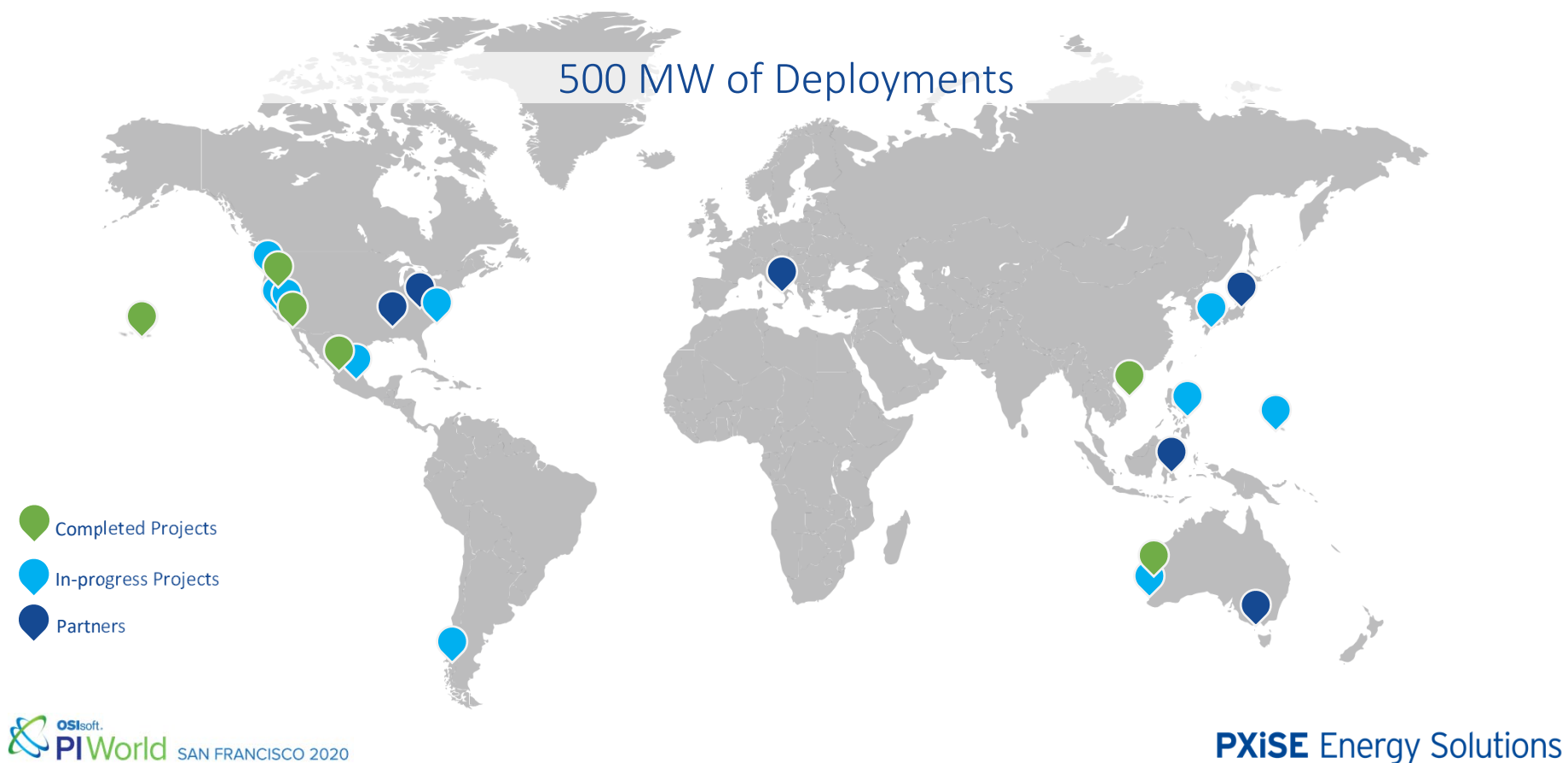
Carbon Neutral
Operations by
2030

The Future of Grid Management

Advanced controls are a tool to integrate and orchestrate a diverse set of energy resources while ensuring system balance, power quality, and reliability.



Global Projects and Partners



Island Microgrid

500 kW solar

600 kW wind

1.2 MW of battery storage

Technical Objective

- Provides precise ramp control to smooth wind power production

Customer Motivations

- Increases revenue and maximizes renewable output with energy shifting and peak management
- Be a carbon-free UNESCO World Heritage Site island by 2030



Western Australia DERMS

8 1-MW natural gas-fueled generators

1-MW diesel-fueled generator

1-MW solar power generation

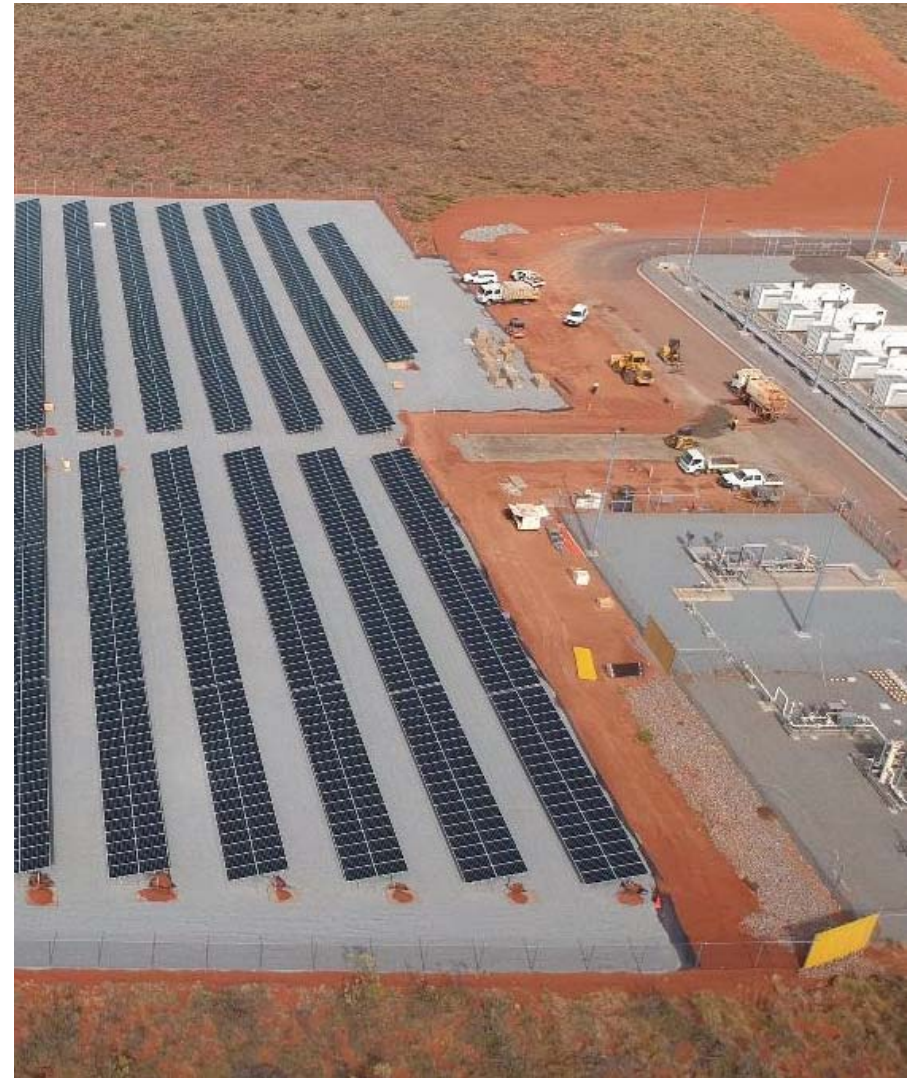
2-MW/1.25 MWh battery storage

Technical Objective

- Integrate hundreds of customer DERs with utility assets

Customer Motivations

- Decrease electricity generation costs and provide more sustainable electricity
- Provide reliability and stability to the grid across the utility's vast territory



Speaker Information



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Questions?

Please wait for
the **microphone**

State your
name & company



Save the Date...



AMSTERDAM

October 26-29, 2020





Summary

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CHALLENGES

- Santa Rosa Junior College (SRJC) is determined to be resilient when faced with natural disasters that disrupt operations.
- SRJC sought a solution that aligns with ambition carbon-free campus goals.
- Worldwide, operators struggle to find solutions to overcome grid instability and poor power quality.

SOLUTION

- PXiSE Energy Solutions partnered with SRJC to deploy a microgrid controller to manage renewable energy generation resources and provide resiliency when faced with grid interruptions
- PXiSE Microgrid Controller will scale to allow for campus wide integration in project phases

BENEFITS

- SRJC is on the path to meet carbon-free campus goals
- Reduced GHG emissions by integrating high levels of renewables
- Enabling campus-wide resiliency, reliability, and improved power quality
- Operational costs reduced with expected energy savings of \$330,000 per year



“PXiSE is proud to partner with SRJC and many other clients around the world to enable them to meet their energy needs. We strive to support a holistic project design that meets the client’s economic and climate goals, and ensure a successful deployment. Our technology will scale with each project to accommodate the addition of more solar, storage, and generation.”

- Patrick Lee, CEO, PXiSE Energy Solutions