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Canary User Conference
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Optimizing Wind and Solar Farms with The Canary System

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Colbun

Transforma • Impulsa • Sueña

AT A GLANCE: ENERGY COMPANY

+1,300 Employees

29 Power Plants

Energy Mix

58% Renewable

42% Thermal

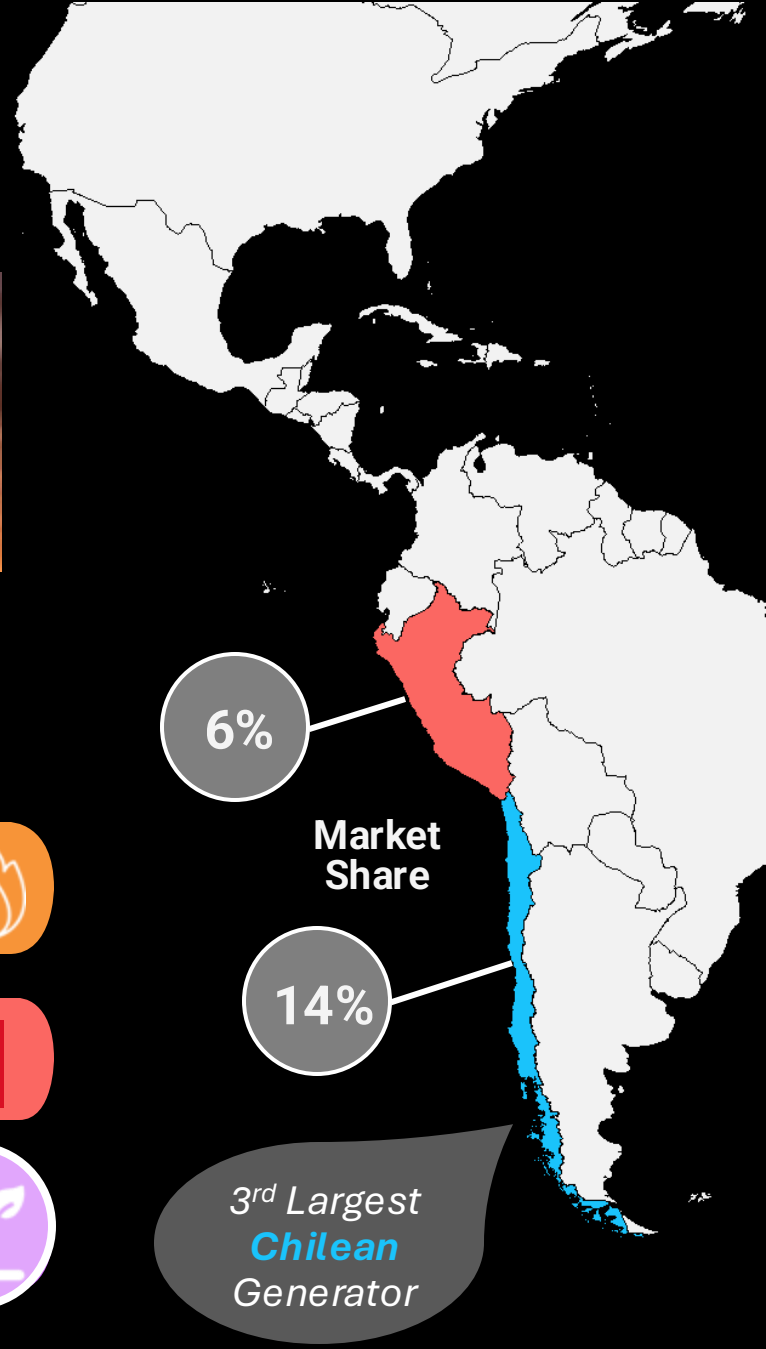
Installed Capacity

4,451 MW

572 MW

Projects pipeline

~6,100 MW Renewable Capacity



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DEPLOYMENT PLANTS OVERVIEW

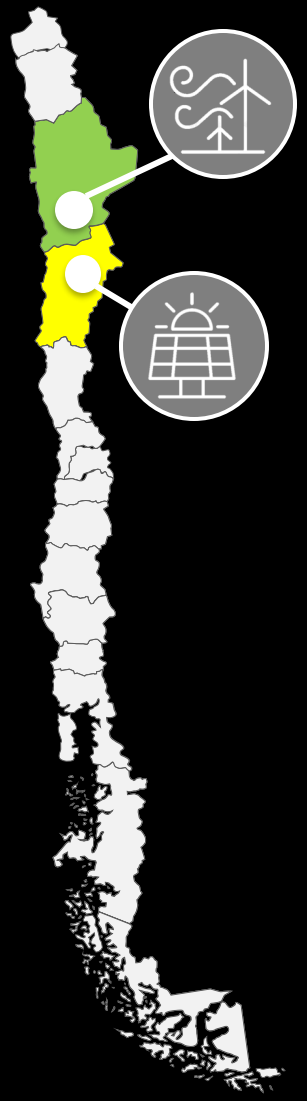
Diego de Almagro Sur
PV Plant

- 232 MWp / +470,000 PV Modules
- ~6k Trackers / 6 Weather Stations
- 32 MWh BESS (Exp. to +900 MWh)

Horizonte
Wind Farm

- 816 MW / 140 Wind Turbines
- 160m Rotor Ø / 100m Hub Height
- Covers ~8,000 ha / ~80 km²

*Largest in **Chile***
*#2 in **Latin America***



Generation equivalent to the consumption of

+825,000

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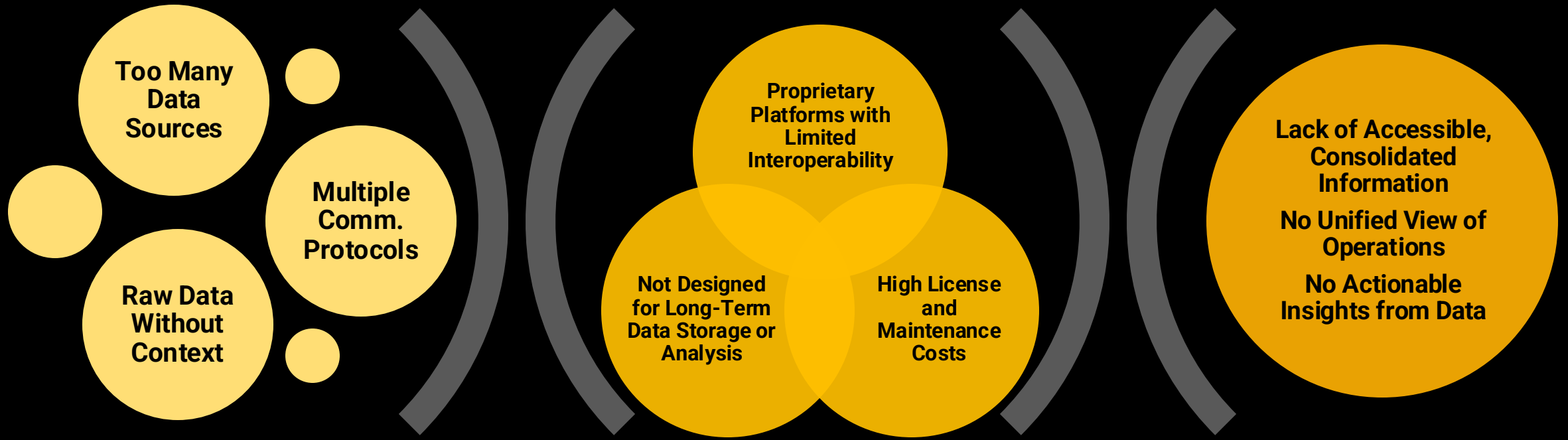
PROBLEM STATEMENT



Devices & Field Data **SCADA Systems** **Business Level**

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CHALLANGE STATEMENT

Colbún's Challenges with Renewable Energy Assets

Characteristic	Traditional SCADA	Company Needs
Field Device Connection	Proprietary system dependent	Direct connection, bypassing SCADA
Data Incorporation	Limited data incorporation	Incorporate all available tags/variables
Asset Monitoring	Limited real-time detection	Granular, near real-time diagnostics
Data Consolidation	Difficult to consolidate diverse sources	Actionable insights for O&M teams
KPI Monitoring	Limited user-friendly tools	Scalable, self-service analytics
Reporting	Manual reportability	Automated reports for maintenance

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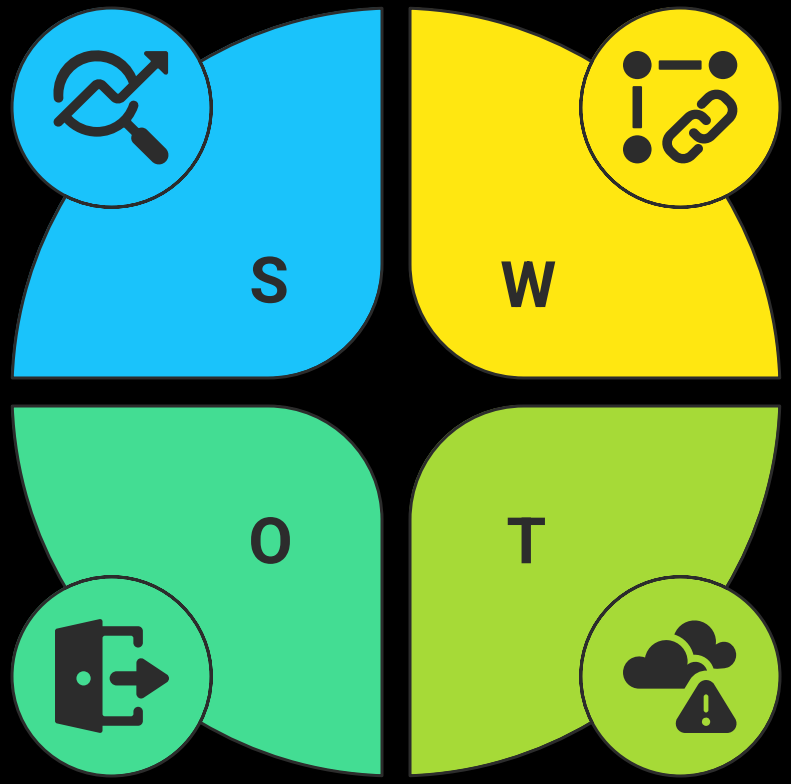
DETAILED ANALYSIS

Colbún's Renewable Assets Management



Strong executive interest

Data visibility and access

Limited data infrastructure

Scalability and reporting limitations

Streamline manual workloads

Improve reporting and device connection

High pressure results

Delays and cultural resistance

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SOLUTION EXPLORATION

Implementing Canary System at Colbún

5 Horizonte Wind Farm

Completing the deployment at Horizonte Wind Farm in a shorter timeframe

4 DAS Solar Plant

Deploying the system at Diego de Almagro Solar Plant as a pilot project

3 Dashboard Development

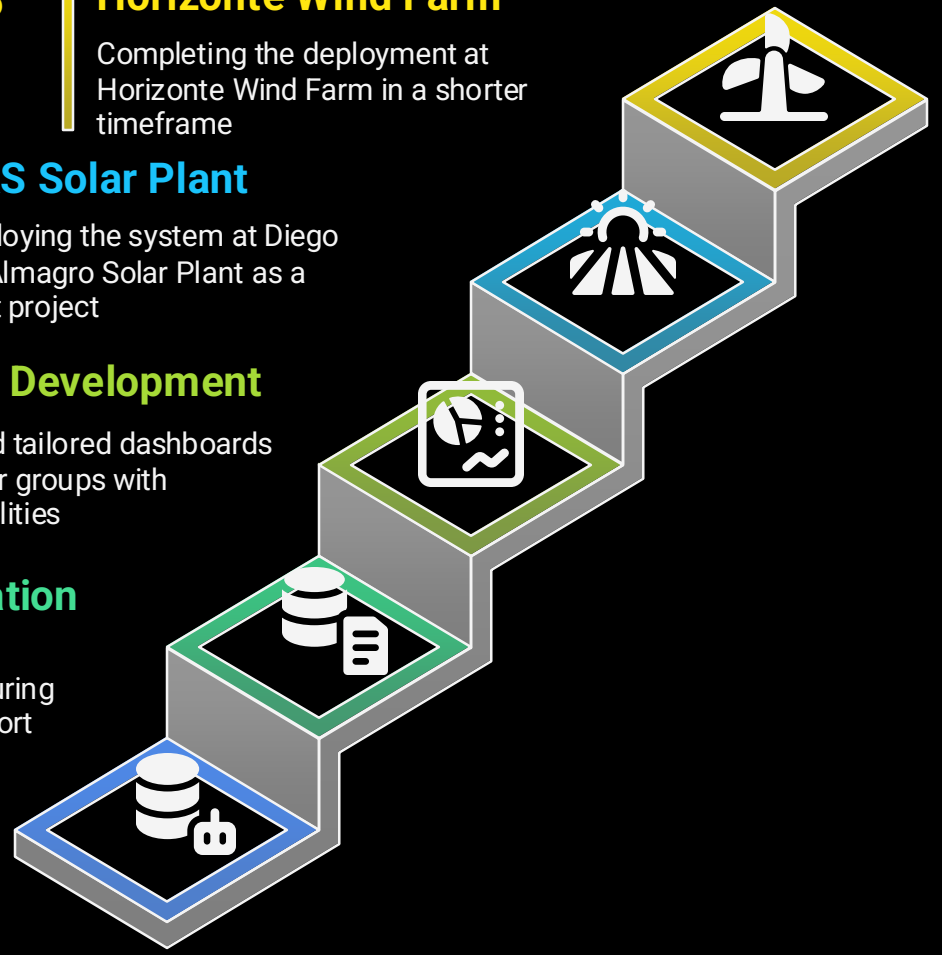
Learning to build tailored dashboards for different user groups with reporting capabilities

2 Metadata Organization

Training on creating Virtual Views in Canary and structuring data through metadata import

1 Data Integration

Introduction to integrating multi-source field data with Kepware KepserverEX



3 month

1 year

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SOLUTION CHARACTERISTICS

Solar Power Plant **Diego de Almagro**	171 Modbus Devices 6 IEC61850 2 OPC UA	67,000 Tags + 30,000 Calculated 70 Calculation Rules + 10 Events 1,500-2,000 Updates / Sec 650 Gb (18 months of data)	Periodic reports Canary API to Power BI and Excel Add-In
Wind Power Plant **Horizonte**	2 OPC UA Servers	29,500 Tags + 7,400 Calculated 29 Calculation Rules + 2 Events 300-500 Updates / Sec 38.5 Gb (3.5 months of data)	Periodic reports Canary API to Power BI and Excel Add-In

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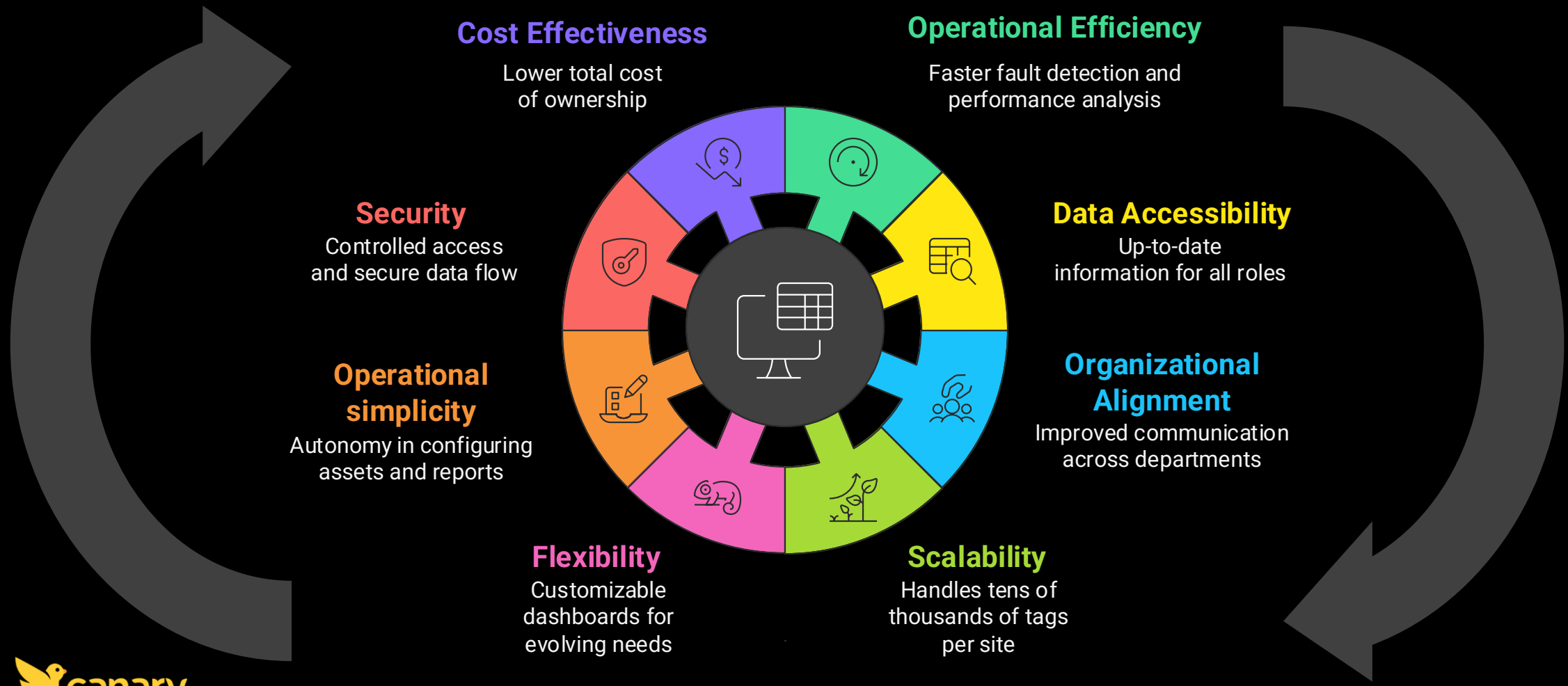
RESULTS AND IMPACT

Canary System Outcomes



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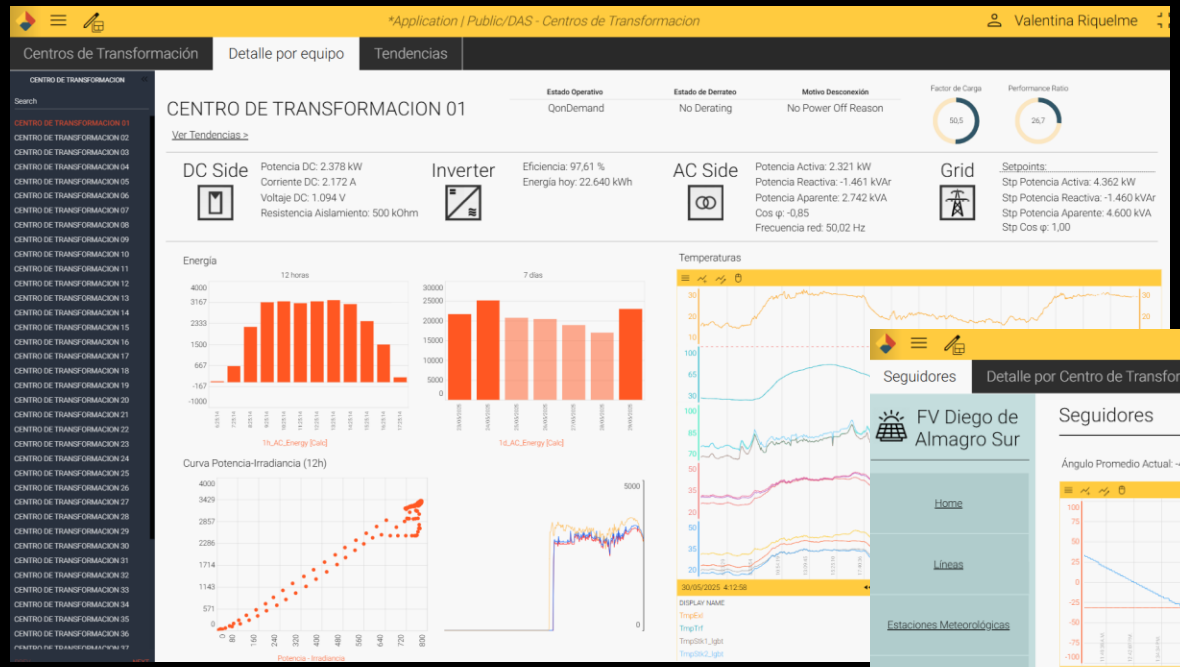
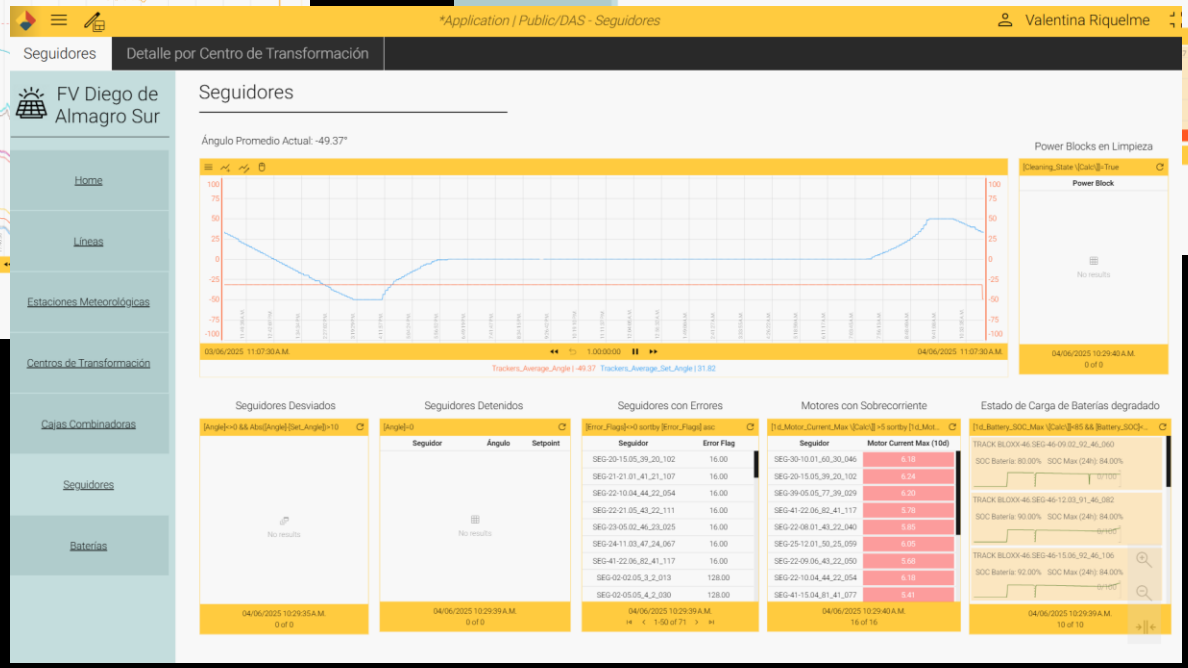
RESULTS AND IMPACT: DIEGO DE ALMAGRO

AXIOM DASHBOARDS : Condition Monitoring and summary display of multiple assets





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RESULTS AND IMPACT: DIEGO DE ALMAGRO

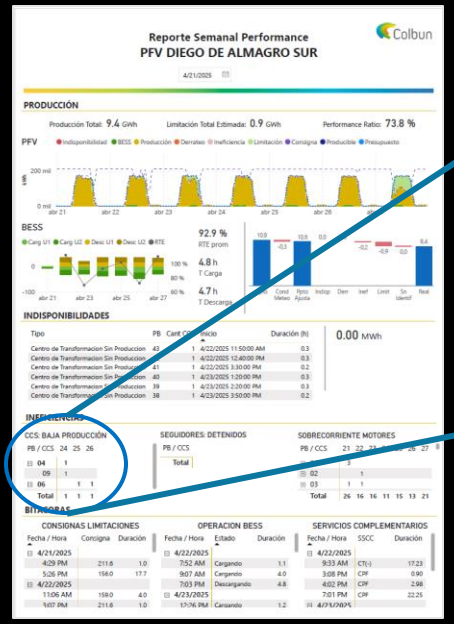
EVENTS: Detection of combiner boxes with disconnected string

Combiner Box Production → Combiner Box Current Expected → String Current Expected → Estimation of Disconnected Strings

Daily Canary Event

REPORTS: Power BI dashboard fed via Canary API

Weekly & daily reports



PB / CCS	24	25
04		1
09	1	
06		1
08	1	

- Evaluation day
- Power station No.
- Combiner Box No.
- Number of strings

O&M personnel inspect and repair on site

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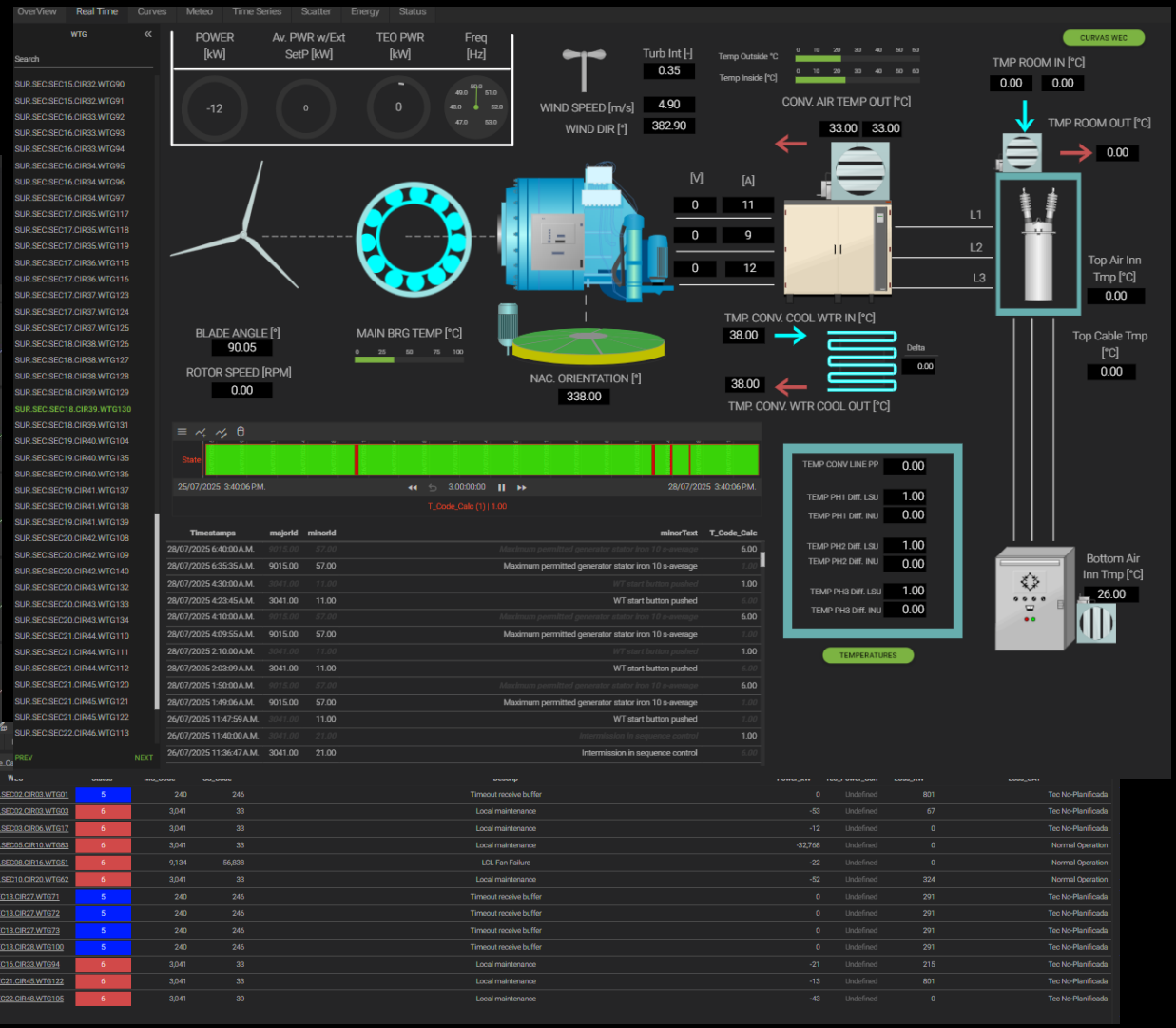
RESULTS AND IMPACT: HORIZONTE

AXIOM DASHBOARDS : Condition Monitoring near real time, and effective Contract control on OEM



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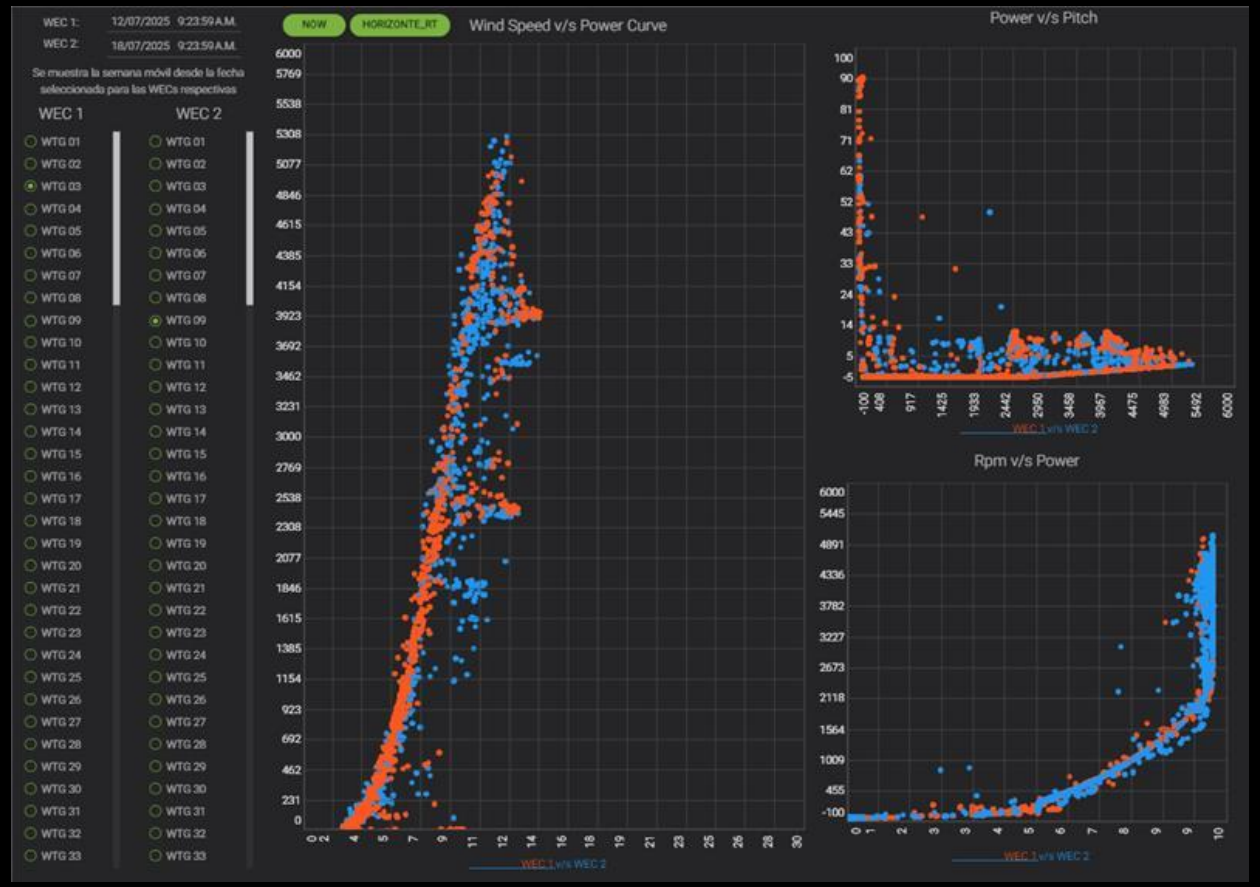
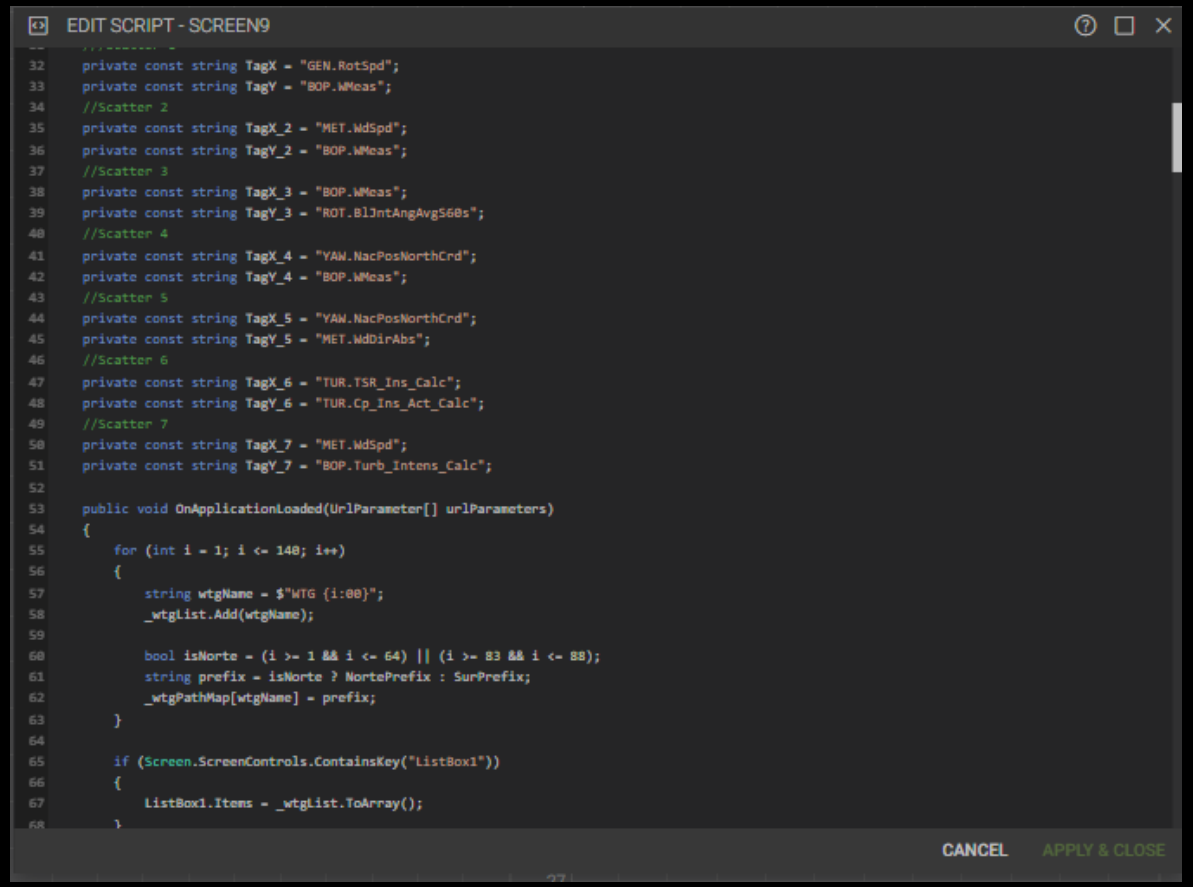
RESULTS AND IMPACT: HORIZONTE

SCRIPTS: Easy implementation to monitor the health of similar assets at different timestamps





RESULTS AND IMPACT

DIEGO DE ALMAGRO SUR: “Canary for multi-asset monitoring and automatic anomaly detection”

A direct reduction of

+15,000 USD

In maintenance costs
~950 man-hours yearly

First detection with Canary avoided losses of

~5,000 USD/Month

from disconnected strings

HORIZONTE: “Canary for effective and systematic Contractual Management with Wind Assets”

Each day without status monitoring

~3,200 USD/Day

in Liquidated
Damages from OEM

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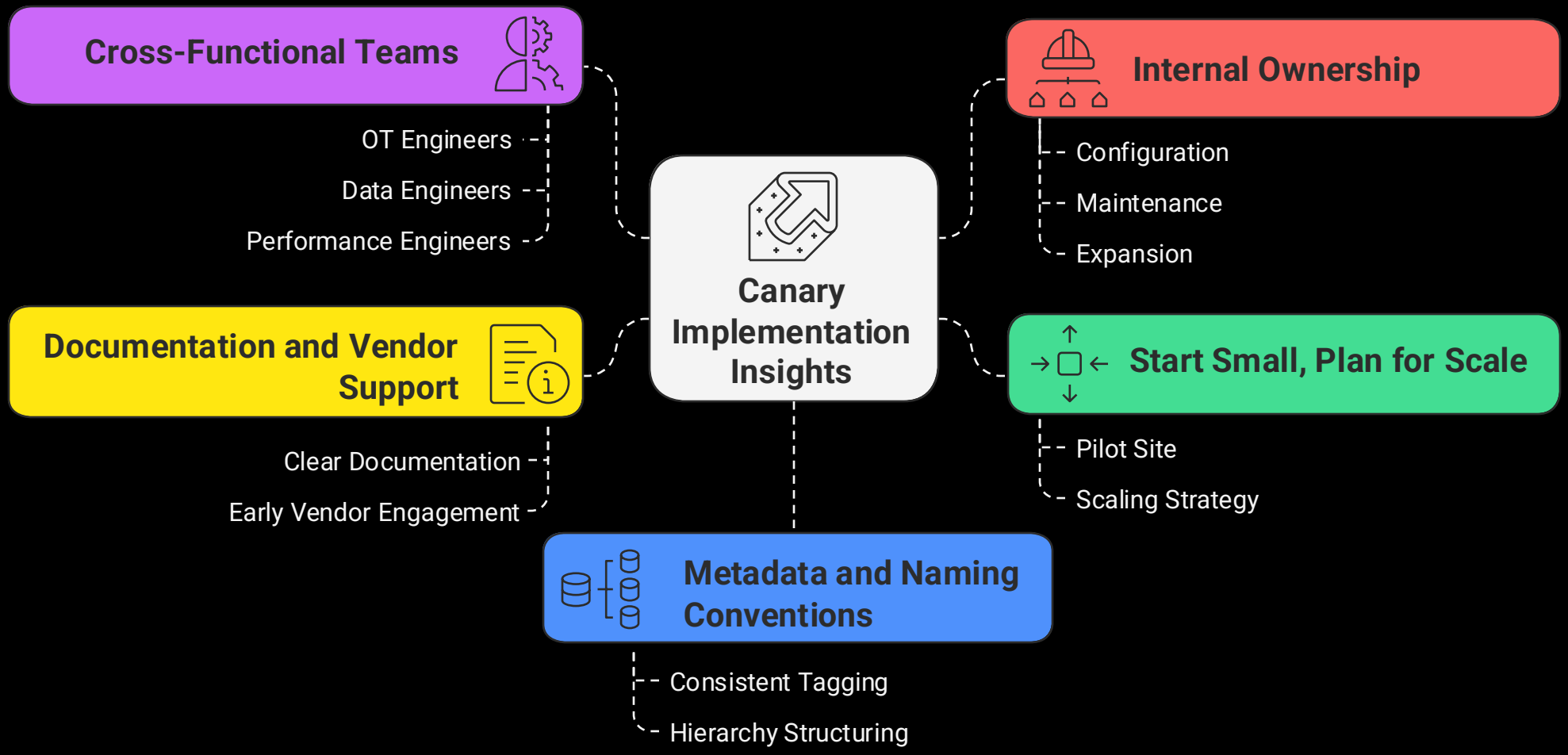
LESSONS LEARNED

Key Insights from Canary Implementation



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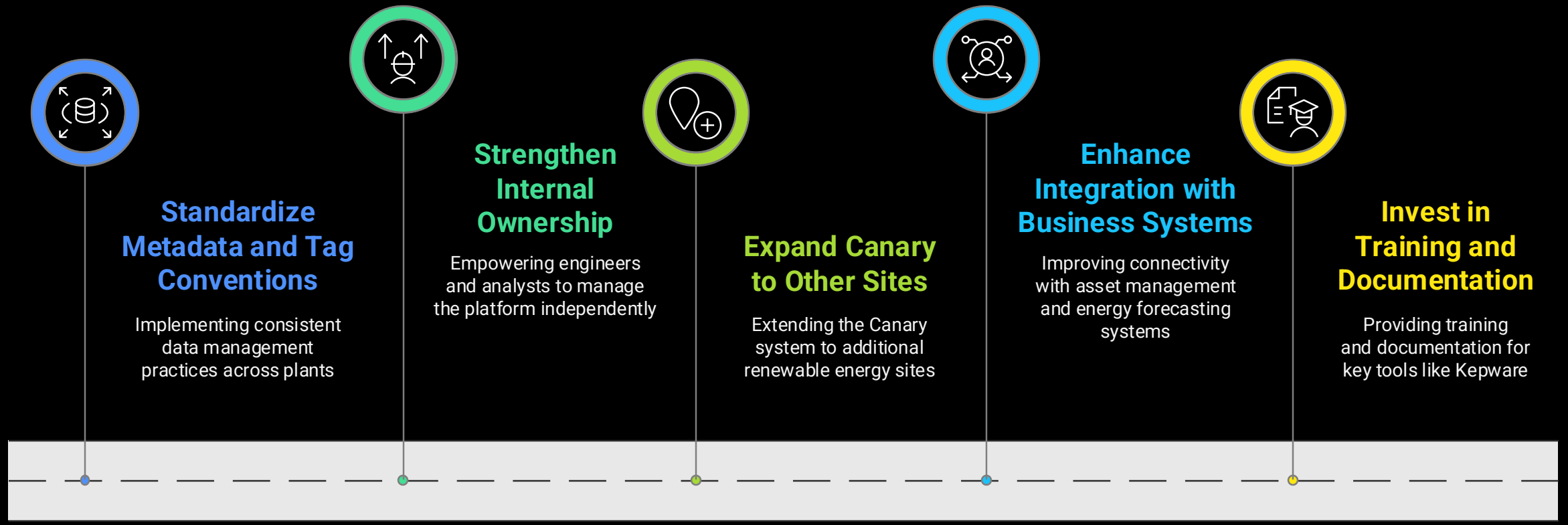
ONGOING FOCUS

Colbún's Strategic Initiatives for Renewable Energy



Standardize Metadata and Tag Conventions

Implementing consistent data management practices across plants

Strengthen Internal Ownership

Empowering engineers and analysts to manage the platform independently

Expand Canary to Other Sites

Extending the Canary system to additional renewable energy sites

Enhance Integration with Business Systems

Improving connectivity with asset management and energy forecasting systems

Invest in Training and Documentation

Providing training and documentation for key tools like Kepware

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Questions ?

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