



Project Canary Technology Overview

September 2022

PROJECT
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Certified Low Methane Gas aka Responsibly Sourced Gas (RSG) Helps Stop Methane Leaks

- RSG undergoes independent, 3rd-Party assessments or scoring of environmental best practices by producers
- Buyers use Purchasing Power to reduce methane emissions and other environmental impacts of natural gas production
- Certified Low Methane Intensity: Top Tier RSG uses continuous monitoring to measure and verify true methane intensities below 0.20% at each well vs. industry average
- Other Environmental Attributes: Low Water Usage, safety, seismic, land, community impacts included
- Larger Volumes Available Now: 20% of US gas market will be certified by end of 2022*



Benefits of Buying Certified Low Methane or Responsibly Sourced Gas

Certified or Responsibly Sourced Gas (RSG) is geologic natural gas with low methane (GHG) emissions and ESG profiles with immediate, low cost, positive impacts.

- ✓ Buying verified low methane natural gas reduces methane leaks and emissions by at a minimum 50% and up to 90%, depending on the basin.
- ✓ Certified gas market incentivizes O&G industry to improve and reduce leaks now
- ✓ Reduced GHG achieved at very low cost - pennies per month
- ✓ Water and other environmental impacts also measured and reduced
- ✓ Allows buyer to choose differentiated product with lower climate impact
- ✓ Simple, low cost implementation - standard gas procurement contracts



How Project Canary Certifies Gas as Low Methane + RSG



1. PC installs state of the art sensors at each well / facility
 - Project Canary owns/controls the monitors for data integrity
 - Data continuously analyzed via cloud to find leaks and measure total pad level methane emissions
 - Operators notified of leaks to initiate mitigation / fixes real time
2. PC performs rigorous environmental assessments of each well
 - Criteria based on best-practices by API, ISO, NORSOK, ANSI+
 - Engineers review 600+ data points + 1000s of pages of docs
 - On-site visits and subject matter interviews by qualified technicians
 - Result: independent environmental score of each well / facility
3. PC issues certificate indicating a well meets Certified Gas Standard
 - PC notifies operator if well / facility falls out of compliance
 - Certified Gas standard establishes methane intensity < 0.20%
 - Delivered electronically via registries or under NAESB contract
4. PC receives no fee connected to the sale of the gas.
 - PC paid to provide the monitors and the certification, like an auditor

TrustWell™ by Project Canary		Certification Minimum Requirements:		
		Below	Good	Excellent
TrustWell™ Specs & Claims Standard Definition Approach & Scoring Standards Technical Components Data Collection Process Verified Attribute: Low-Methane Verified Attribute: Freshwater Friendly Verified Attribute: Safe Operator Verified Attribute: Chemical Steward	Rating	The operator has completed the TrustWell certification process: Performance Rating above Minimum 75% of certification visits during site visit		
	Environmental Programs (Water, Air, Land, Community)	The operator clearly demonstrates a commitment to environmental stewardship by: Documented L200 emissions monitoring plan in accordance with EPA (and/or) requirements The operator has a direct line of communication for local community members to voice concerns, comments, or complaints Announced commitments to reducing methane emissions and proper handling/measuring routine outflow Methane emissions below established thresholds The company recycles/reuses some portion of produced/flowback water for operations Company tracks the source and quantity of freshwater withdrawals used for operations		
	Verified Attribute: Low-Methane	The operator has qualified for the low methane verified attribute (effective 03/01/2020): Methane intensity below established thresholds L200 emissions monitoring plan above EPA (and/or) requirements Reduction of methane emissions with 12-year proven track record		
	Verified Attribute: Freshwater Friendly	The operator has qualified for the freshwater friendly verified attribute (effective 03/01/2020): Operator tracks the percentage of water sourced for operations pulled from freshwater sources Operator tracks the percentage of produced water that's recycled for reuse Completion of at least 1 baseline study or community impact study pertaining to water usage		
Well Prevention Waste Management Emergency Response Well Integrity	Well Prevention	Documented spill prevention/response program containing: Types of potential spills, required PPE, and necessary training to respond to each type of spill Containment protocols and personnel clearly established in the spill response plan Pre-determined response locations containing appropriate spill response equipment		
	Waste Management	Waste management program: Contains criteria for types of waste and requirements for separation of wastes L200 approved disposal facilities for each type of waste Handover on an annual basis Documents where waste is generated from and the quantities produced		
	Emergency Response	The operator has provided an emergency response plan (or equivalent) that: Addresses any potential emergency situations the operator may encounter (operations, weather, etc.) Incorporates strategy, tactics, required capabilities, risk assessments, and business impact scenarios into the plan Addresses mandatory training for executive leadership Updated annually or earlier The addition of annual (minimum) on-site drills involving executive leadership, community stakeholders, and local emergency responders Updated annually Contains competency testing of emergency training		
	Well Integrity	The operator successfully addresses well integrity issues by: Conducts and documents API checks at routine wellhead inspections Installation of SCADA monitoring at the wellhead Installation of SCADA monitoring with remote shut-in capability Wellheads and valves are in underlying/working condition and ALL subsea/undersea are accessible		

Platinum-Standard: Environmental Assessments, Continuous Monitoring & Quantification

Environmental Assessment Air, Land, Water and Community (TrustWell® by Project Canary)

- Robust review of environmental risks and risk-mitigation efforts
- Site visits and interviews for every asset assessed
- Certification: Platinum, Gold, and Silver



Continuous Monitoring Technology & Web-Based Dashboard

- Canary X – 24/7 real-time monitoring technology using high-fidelity methane detection
- Web-based dashboard with ML-based smart alerts



Quantification of Emissions Intensity

- ML-based regression and plume models used to localize and quantify total site emissions
- Hourly mass-value emissions profile by equipment





Continuous Monitoring – Canary X

Canary X – Continuous Monitor

Our Flagship Device, Deployed on 1,000+ Sites Across North America.

Canary X Unit

Modular and affordable, cellular connection, 10+ days of backup battery power, 1 year of data storage. AWS encrypted to dashboard

Anemometer

Precise wind speed and direction. Key to mass quantification and source attribution

Pole

- 10 feet long
- 1.5 inches diameter
- 1.5 feet below grade
- Ideally cemented

Solar Power Panels

20W – 30W solar panels



Canary X – Performance

Highly Accurate, Cost-Effective & Reliable.



Localized

100%

Facilities monitored



Real-Time

24/7

Data collection



Accurate

0.4 ppm

Lower detectable limit

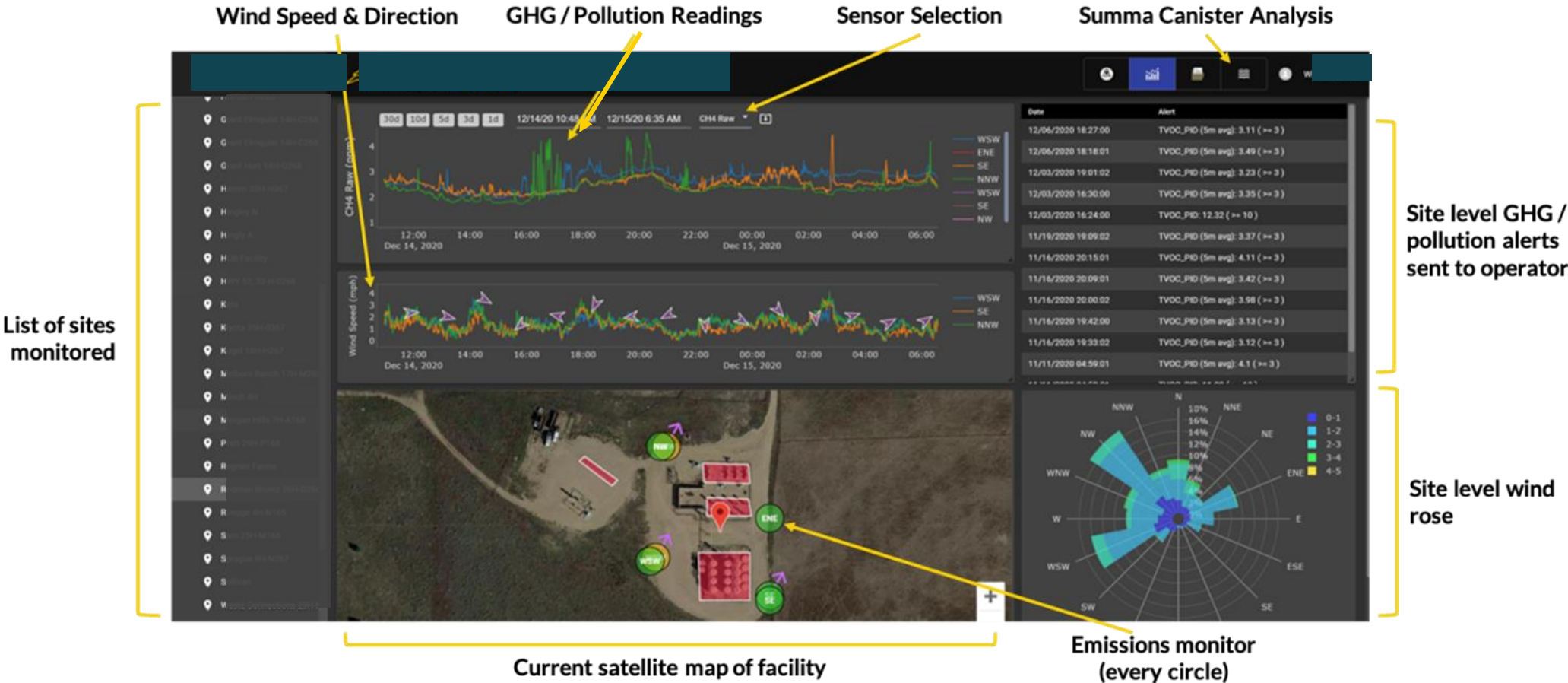


Canary X Technical Specifications	
Measurement principle	Tunable Diode Laser Absorption Spectroscopy (TDLAS)
Target gas	CH ₄
Average Lifetime Use	7 years
Regular Maintenance Requirements	Low
Lower detectable limit	0.4 ppm
Precision	≤ 0.25-0.8 ppm with 10 s averaging
Accuracy	1-2 ppm
Temperature operating range	-10 to 65°C (14 to 150°F)
Concentration range	0-10,000 ppm
Sampling rate	2 Hz
Resolution	0.01 ppm



Canary X – Integration

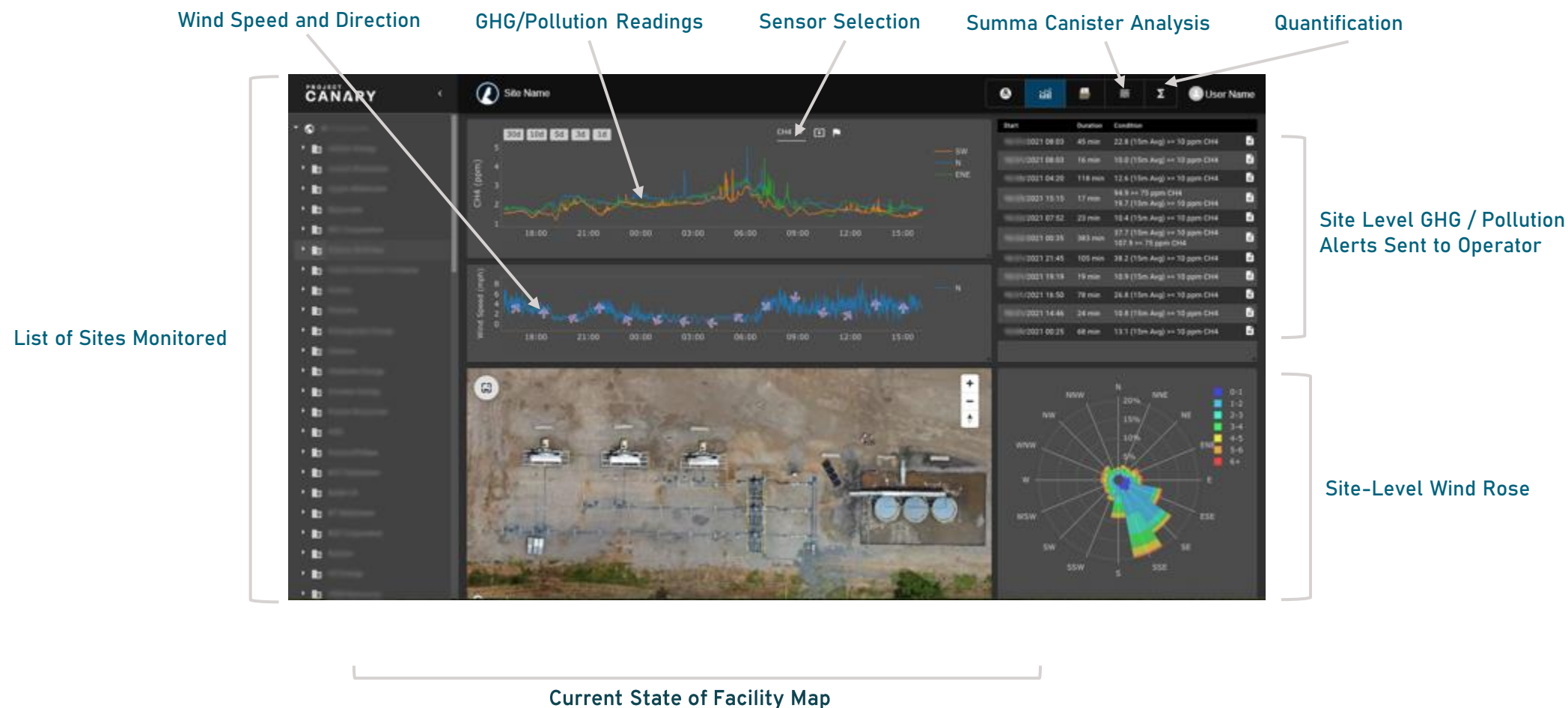
Canary X data is displayed in a web-based dashboard and offered as an API for operators



The background of the slide features a photograph of dark, silhouetted plant branches in the foreground, set against a bright, hazy sky with a warm orange and yellow glow, suggesting a sunset or sunrise. A semi-transparent dark blue horizontal band spans the width of the image, serving as a backdrop for the title text.

Quantification

Sensor Data is Displayed in Real-Time With Web-Based Dashboard and Offered as an API for Operators



A Traceable Value Chain. Site-Level Quantification of Emissions

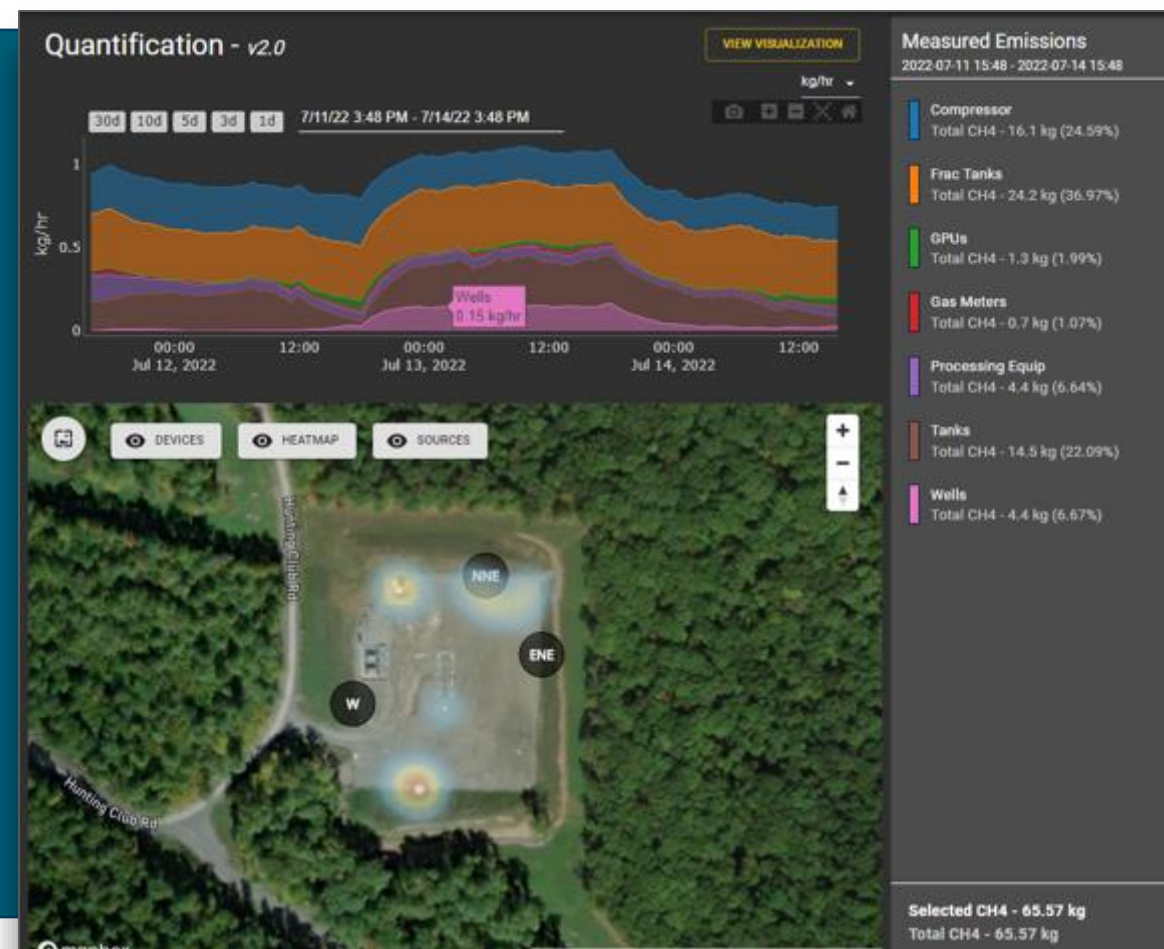
Project Canary Certifies Actual Performance Data. Others Certify Estimates

- Accurate Emissions Profile

Machine-Learning-based regression and Gaussian plume models are used to localize emissions data at the equipment group level and serve up total site emission data. Tested within 3% of METEC controlled release data.

- Actionable Insights to Reduce Risk

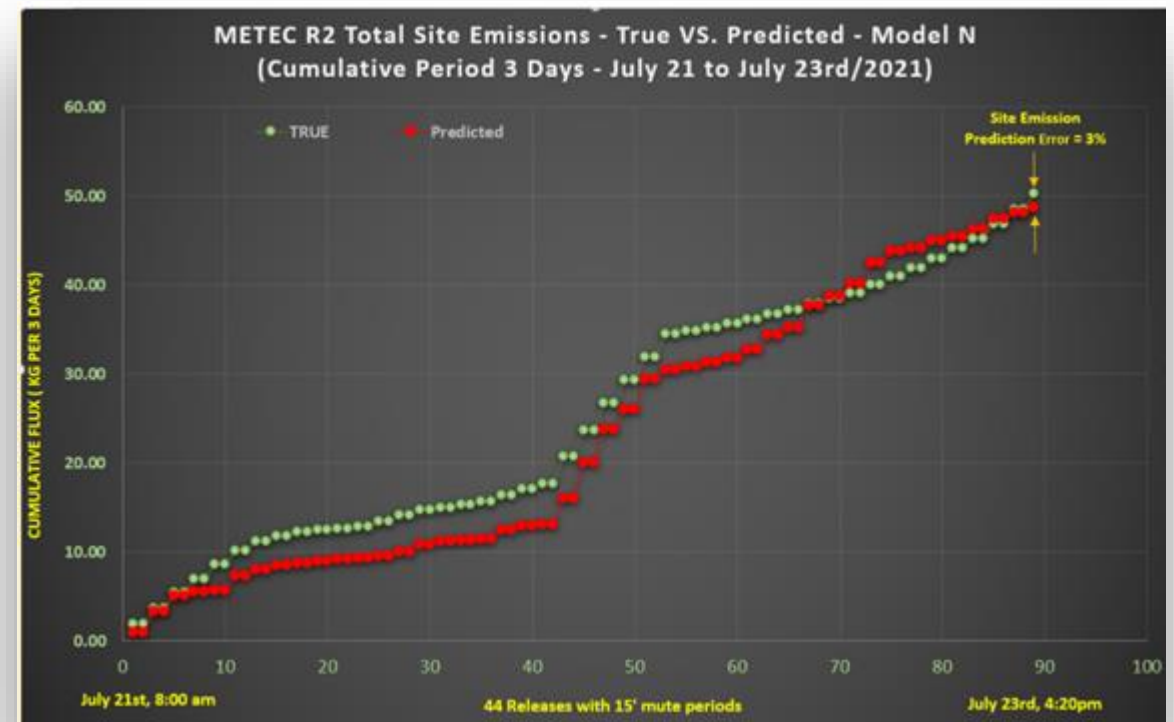
Trained models predict emissions and trigger smart alerts when actuals deviate from the forecast.



TECHNICAL INFORMATION

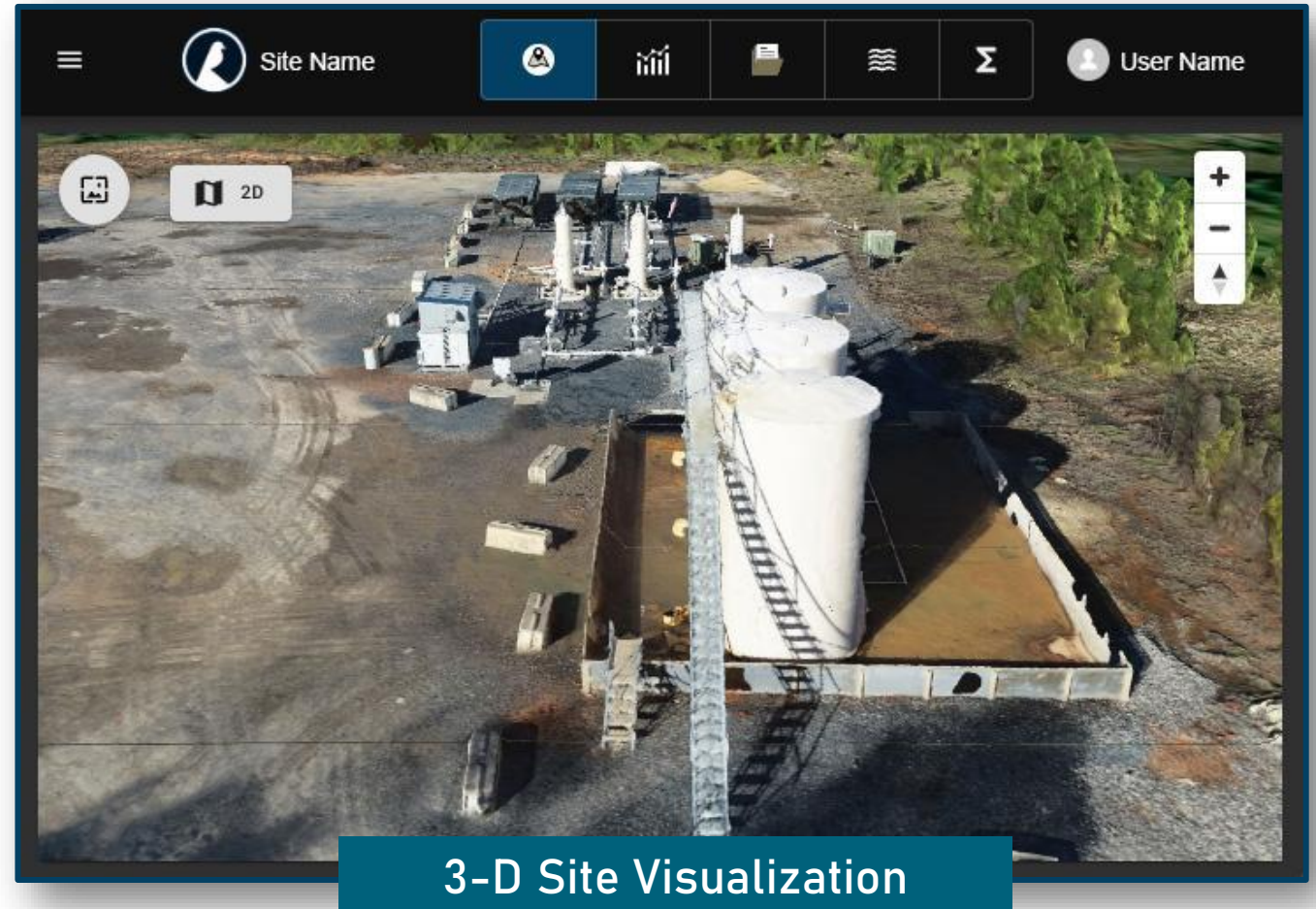
Academic Study: METEC Demonstrates Accurate Results

- ▶ 44 different methane releases spanning 3 days
 - ▶ Release rates vary from 0.05 grams per second (g/s) to 0.85 g/s
 - ▶ Emissions released from 3 different types of equipment
 - ▶ Algorithm left to determine:
 - Emission source (location)
 - Flux rate (g/s)
 - Release duration (minutes)
- ▶ Cumulative modeled emissions within 3% of actual emission



High-Fidelity Quantification Relies on Site Specific Preparations

- 1 High-resolution drone imagery of well pad
- 2 Strategic Canary device placements (3 X's minimum)
- 3 Precise GIS mapping of on-site and off-site emission sources
- 4 Site emissions-performance data (30 days minimum)



Site-Specific Volumetric Methane Measurement

Project Canary's quantification algorithm leverages machine learning and long-term statistical analysis to measure persistent, short, yet cumulatively large emissions

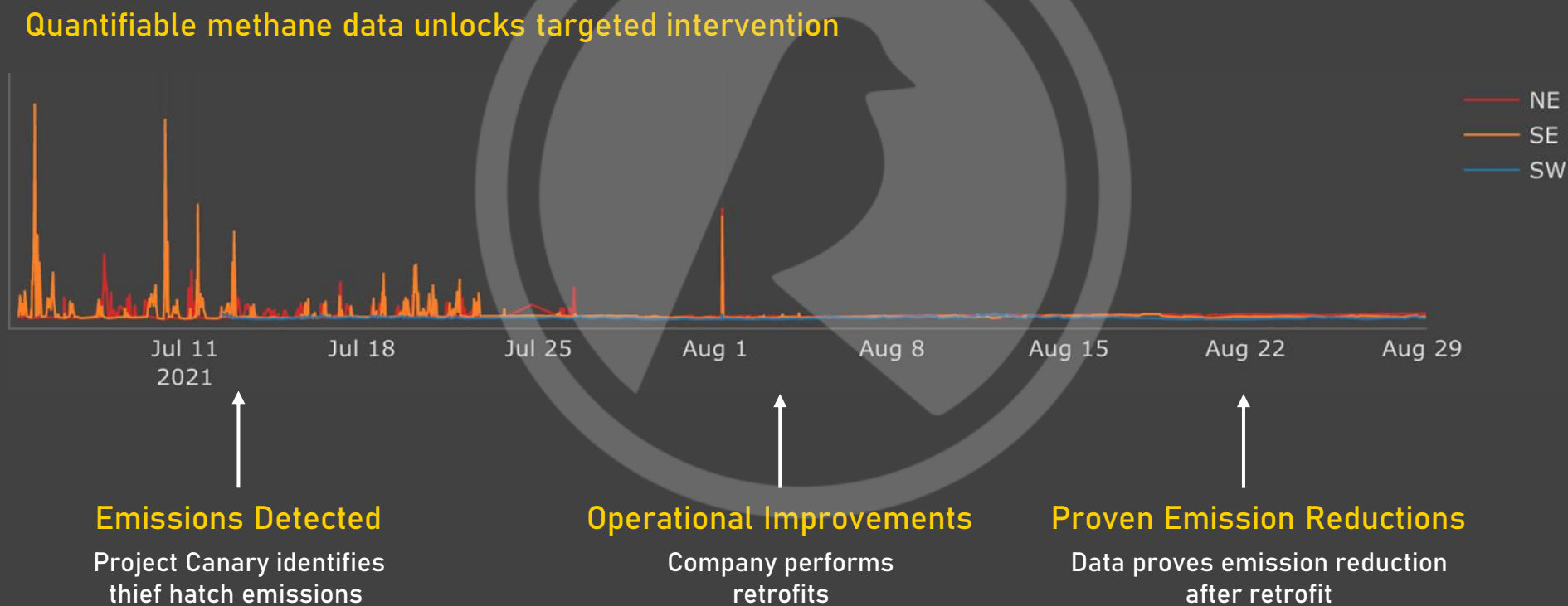
Quantifying Emission Sources Visualization



The Project Canary Model:

- Differentiates off-site emission events from on-site emission events
- Utilizes historical data trends from real-time monitoring
- Understands relationship between elevated concentration and atmospheric conditions
- Calculates the emission rate from the well pad every 15 minutes utilizing real-time data
- Quantifies multiple emission sources simultaneously producing a holistic view of a facility's emissions profile
- Measures methane intensity

Climate Action With Facility-Level Continuous Monitoring





THANK YOU

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Project Canary - as a certified public benefit corporation - is working to drive a transparent approach to RSG assessments that enables public proof of performance and progress over time.