



Streamlining Green Energy Operations: Longroad Energy's Data Integration Transformation

Case Study



partner
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SaaS Architecture
Competency

Streamlining Green Energy Operations

CloudGeometry's end-to-end integration empowered Longroad Energy to streamline their operations. They created a flexible data pipeline, enriched data value, and incorporated IoT signals, enabling automated maintenance and improved efficiency.



INDUSTRY

Renewable Energy, Technology, Utilities and Energy Management, Cloud Computing, Data Analytics and Business Intelligence

SOLUTION

Timely insights, well-aligned operational data, and enhanced decision-making for clean energy generation.

CLIENT

Longroad Energy

Longroad

Longroad Energy (LRE) is a leader in making clean wind and solar energy a reality, with 7,000+ wind and solar projects across North America. LRE manages the entire process of generating clean energy and delivering it to the grid. The company handles the whole project lifecycle, from site selection through construction and operation. Keeping solar and wind operations producing electricity for tens of thousands of customers also meant handling mission-critical maintenance.

To manage this ambitious lifecycle, LRE assembled a portfolio of off-the-shelf SaaS products, spanning tools for land rights research, engineering, construction oversight, permitting, as well as both preventative and reactive maintenance.

The Challenge

After 15 years of experience and expansion, the portfolio of off-the-shelf SaaS business processes and operational systems had grown increasingly difficult to manage. Data integration became more and more difficult. Imagine if you had to coordinate data from many different operational and business systems; get it wrong, and your ROI evaporates. Worse yet, your utility customers suffer needless power interruptions.

LRE needed a continuous, consistent information flow of actionable insights across the organization to simplify decision-making. From tech support to the executive suite, business professionals needed clear, well-organized, readily quarriable data. Inputs from power plants, field maintenance systems, and business processes (e.g., Finance) combined with IoT capture, secure file sharing, ERP, and project work order management – all were essential for launching and operating green power sites.

Virtualized SaaS Data Pipeline

S3 buckets store partitioned raw data, enabling support for ad-hoc queries from Amazon Athena.

Serverless data orchestration

Event-driven serverless functions and batch processing generate hourly, daily, and monthly aggregates, combining microservices and AWS Lambda.

Multi-Tenancy Data Warehouse

Stored in RDS Aurora, an easy-to-administer database with security features and scalable processing.

Longroad

The Solution

As SaaS development and cloud data engineering experts, CloudGeometry was a natural choice for end-to-end integration. LRE's constant growth needed a flexible data pipeline approach, covering use cases from day-to-day Operational Analytics to Business Intelligence. CloudGeometry experts designed and built a set of cloud processing components to run an integrated data pipeline. Using the broad portfolio of AWS tools and services, CloudGeometry took API output from the existing commercial off-the-shelf SaaS systems and architected it to enrich the data value chain. These include:

- All-in-one IoT signals collection from wind and solar plants, pre-aggregated by sources and consumers
- Computed thresholds to trigger automated repair work orders and to drive better MTBF/MTTR
- ERP finance and accounting system for logical integration of data sources and business rules
- Algorithms tying geographic data to weather history and forecasts
- Data distribution to various Regional Power Transmission Organizations and asset owners

CloudGeometry integrated these discrete data sources into a tiered data pipeline. The pipeline enabled multiple decision support use cases. In addition, CloudGeometry created a comprehensive reporting application that makes it possible for users to easily gain insights. These insights include how and where energy has been generated, and reports can be created in multiple formats.

Careful design for software reuse also enabled the rapid creation of new features. Changes can now be designed and implemented more quickly with days, not months. These new features include both operational improvements and the ability to leverage new AWS cloud-based analytics services.

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cloudGeometry

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The Benefits

To quote [AWS CTO Werner Vogels](#), “[Operations are forever](#)”.

For LRE, it’s nothing less than keeping the lights on. Their systems now collect and process data and monitor the data pipeline. They also match plant-level events and anomalies with work order data. End users at all levels get a well-aligned view of operational data, incidents, and maintenance events. By resolving multiple sources and data models into a single versatile stream, LRE, and its customers benefit from timely information generated from the SaaS systems they already rely on.

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AI/ML & DATA

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With roots in Silicon Valley, we've seen firsthand what works (and what doesn't). Count on CloudGeometry to accelerate application modernization, Kubernetes adoption, developer enablement, secure multi-tenancy, AI/MLOps, DevOps automation and more.

- As **AWS Advanced Consulting** partners, our certified solution architects and platform engineers help address the range of challenges facing enterprise innovators and venture funded startups alike.
- The **Cloud Native Computing Foundation** has accredited us as a **Kubernetes Certified Service Provider**.
- We serve as charter contributors to the **Linux Foundation Data & AI Commons** (LF Data & AI), supporting a diverse, sustainable ecosystem for open source data and AI technologies.

Over the last decade, we've built and deployed hundreds of big, fast full-stack apps with well-engineered cloud infrastructure across industries: Financial Services, Industrial Automation, Healthcare, AdTech, Consumer-grade Mobile, smart devices, and more.

From enterprise upgrades to data engineering to cloud-native scale-out, CloudGeometry helps you plot the shortest path across all dimensions of modern cloud software engineering.

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