

Global Gas Manufacturer Gains Real-Time ERCOT Grid Visibility with AI Energy Management



Value-Driven Benefits

\$1.4M

in annual energy cost savings potential across facilities on ERCOT grid

100%

accuracy in predicting grid-wide peak events, capturing peaks that were missed by the baseline solution

65%

accuracy in real-time price forecasting

Introduction

A leading global industrial gas manufacturer, with operations spanning dozens of countries and tens of thousands of employees worldwide, is a major producer of industrial gases serving critical sectors such as energy, chemicals, and manufacturing. With significant electricity demand across its production facilities, the company faced rising energy costs and mounting exposure to volatile electricity markets.

Challenges

In Texas, where several of its largest plants operate within the Electric Reliability Council of Texas (ERCOT) grid, the company incurs high electricity costs during high demand or tight supply periods—particularly in the summer months when exposed to Four Coincident Peak (4CP) transmission charges. Missing a 4CP event or reacting too late to a real-time price spike can result in hundreds of thousands of dollars in avoidable cost. Managing these risks without impacting production and safety is critical.

To address this, the company sought an advanced AI-driven solution capable of more accurately predicting 4CP events, enabling operational teams to manage consumption, reduce peak-related charges, and maintain production commitments. Prior to engaging C3 AI, the manufacturer had developed an in-house AI-based solution that predicted most—but not all—4CP events, leaving meaningful cost savings unrealized.

Solution

The company partnered with C3 AI to implement C3 AI Energy Management on Microsoft Azure in just 26 weeks across three ERCOT facilities. The solution unified more than five years of historical grid and market data across 14 datasets and established live data pipelines refreshing every 15 minutes, creating a continuously updated foundation for forecasting and decision-making. Four ML models were trained to forecast system-wide load, predict 4CP events, and anticipate real-time price volatility. These capabilities provided a real-time, unified view of grid conditions and forecasts across sites.

Results

C3 AI Energy Management empowers energy managers to monitor conditions in real-time, collaborate seamlessly coordinate across sites, and take timely curtailment or load-shifting actions, unlocking up to \$1.4M in additional annualized savings for the manufacturer. The C3 AI solution also achieved 100% recall of 4CP events, capturing peak events missed by the internal model. Given the initial success, the company manufacturer is scaling the solution beyond ERCOT, beginning with PJM Interconnection and subsequently, followed by Midcontinent Independent System Operator (MISO) and New York Independent System Operator (NYISO), as part of its multi-region energy optimization strategy.

Challenges

Before implementing C3 AI Energy Management, the energy team relied on a combination of internal forecasting tools, operational dashboards, ERCOT publications, and ad hoc market insights to prepare for both 4CP and peak price events. While these tools provided valuable inputs, energy managers had to manually consolidate data across multiple systems to determine whether curtailment was necessary. This process required continuous monitoring, especially during periods of rapidly changing grid or market conditions.

For price forecasting, the team had not historically relied on ERCOT day-ahead market signals due to their volatility and lack of reliability for real-time operational decision-making. As a result, price-driven curtailment actions were rarely executed.

Additionally, cross-team coordination was managed through email, messaging, and phone calls, making it difficult for all stakeholders to maintain a shared view of the latest forecasts and assumptions across sites.

This fragmented workflow limited the team's ability to rapidly evaluate scenarios, align decisions, and act on time-sensitive opportunities.

Approach

Over 26 weeks, C3 AI partnered with the manufacturer to deploy C3 AI Energy Management across three ERCOT facilities. The joint team began by integrating more than five years of external market and grid data, including ERCOT system load, generation capacity, real-time and day-ahead pricing, and weather signals. These inputs were unified to create a consistent view of grid conditions that could support forecasting and operational decision-making.

Building on this foundation, C3 AI configured 14 live data pipelines refreshing every 15 minutes, ensuring forecasts were continuously updated to reflect rapidly changing market conditions. The deployment included four ML models to forecast ERCOT system-wide load, predict 4CP events, and anticipate real-time price volatility. Each forecast was delivered with evidence packages, enabling operators to validate performance against actual outcomes and build trust in the models.

To drive adoption, C3 AI configured a centralized user interface for real-time monitoring and alerting, with embedded collaboration features such as user tagging, comments, and workflow tracking. This streamlined decision-making and reduced reliance on emails and spreadsheets, while establishing a scalable foundation to expand AI-driven energy management to additional regions.

About the Company

- \$10+ billion in annual revenue
- 50+ countries of operation
- 100+ production facilities worldwide
- 20,000+ employees

Project Highlights

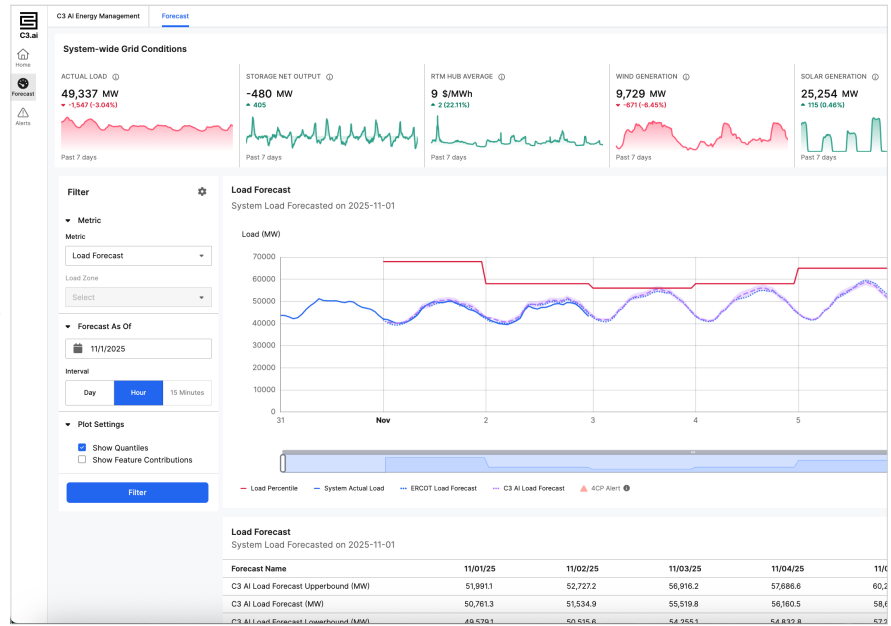
- 26 weeks from project kickoff to production-ready application
- 5+ years of historical of historical ERCOT market data integrated
- 150M+ rows of historical data used to train ML models
- 14 live data pipelines ingesting updates every 15 minutes
- 4 ML models configured and deployed for load, 4CP, and price forecasting
- Configured single-pane-of-glass user interface for real-time monitoring and alerts
- Collaborative workflows enabling user tagging, comments, and coordinated actions

Solution Architecture



Enterprise Data

- Facility Location & Details
- Demand and Load Forecast
- System-Wide Capacity
- Solar Generation
- Wind Generation
- Generation Outages
- Electricity Pricing
- Weather
- Commodity Prices



Proven Results in Initial Production Deployment
 Visit C3.ai/get-started