

CausalX Energy GTM

An Intelligence driven system for energy decisions:
from telemetry and transactions to evidence-backed action.

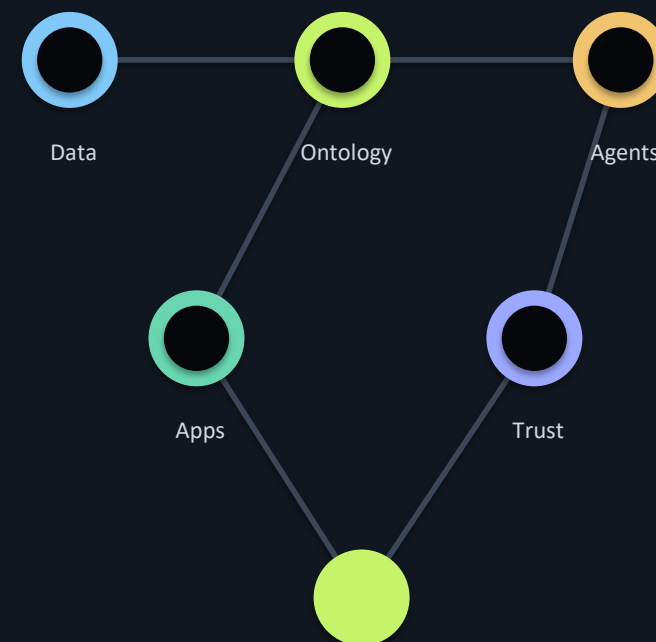
Grid reliability

Plant performance

Revenue protection

Energy decision operating core

Ontology // agents // apps // governance



Energy operations are saturated with systems, but starved of decision context

CausalX is positioned as a decision operating system: one place to model the grid, reason on causes, and capture auditable actions.

● Telemetry without story

SCADA, AMI, OMS, billing, maintenance, and market feeds are rich in events but poor in shared context.

● Analytics without accountability

Operators need to know why an event happened, what evidence supports it, and who should act next.

● Actions without traceability

Utilities face regulatory, safety, and reliability pressure; decisions need a full chain of evidence.

From fragmented stack to decision core

System sprawl

- OMS
- AMI/MDM
- SCADA
- Billing
- Work orders
- Market data

Shared operational model

- Gold facts
- Entity model
- Ontology
- Causal DAGs
- Evidence
- Recommendations

Decision advantage

- Faster RCA
- Governed answers
- Operational actions
- Reusable agents
- Buyer-specific apps

CausalX looks and behaves like an energy operating system

The solution has primarily four building blocks that make the story credible: shared model, agentic reasoning, operator applications, and governance.



Architecture for energy decisions

Decision Intelligence at the heart

Enterprise systems

- OMS / outage
- AMI / MDM
- SCADA / historian
- Billing
- Work orders
- Market / load

Data foundation

- Bronze / connector pattern
- Silver / conformed entities
- Gold / 10 facts + 5 dimensions
- Metadata and catalog

Ontology + logic

- Entity model
- Ontology registry
- Agent DAGs
- Prompt and query services

Agent operations

- AIService
- DataEngine
- Agent selection
- Streaming execution graph
- Recommendations

Applications + trust

- Dashboard
- Evidence and answer display
- Data catalog
- Agent pool
- Governance and trace

● DATA

Gold facts and dimensions are the repository source of truth for utility analytics.

● LOGIC

Deterministic causal DAGs make agent reasoning auditable and reusable.

● ACTION

Recommendations exist today; connector-backed action/writeback is the natural extension path.

● TRUST

GovernanceService records intent, activated agents, data access, and outcomes.

SOLUTION FLOW I

Operator

Question-to-decision flow inside the current product

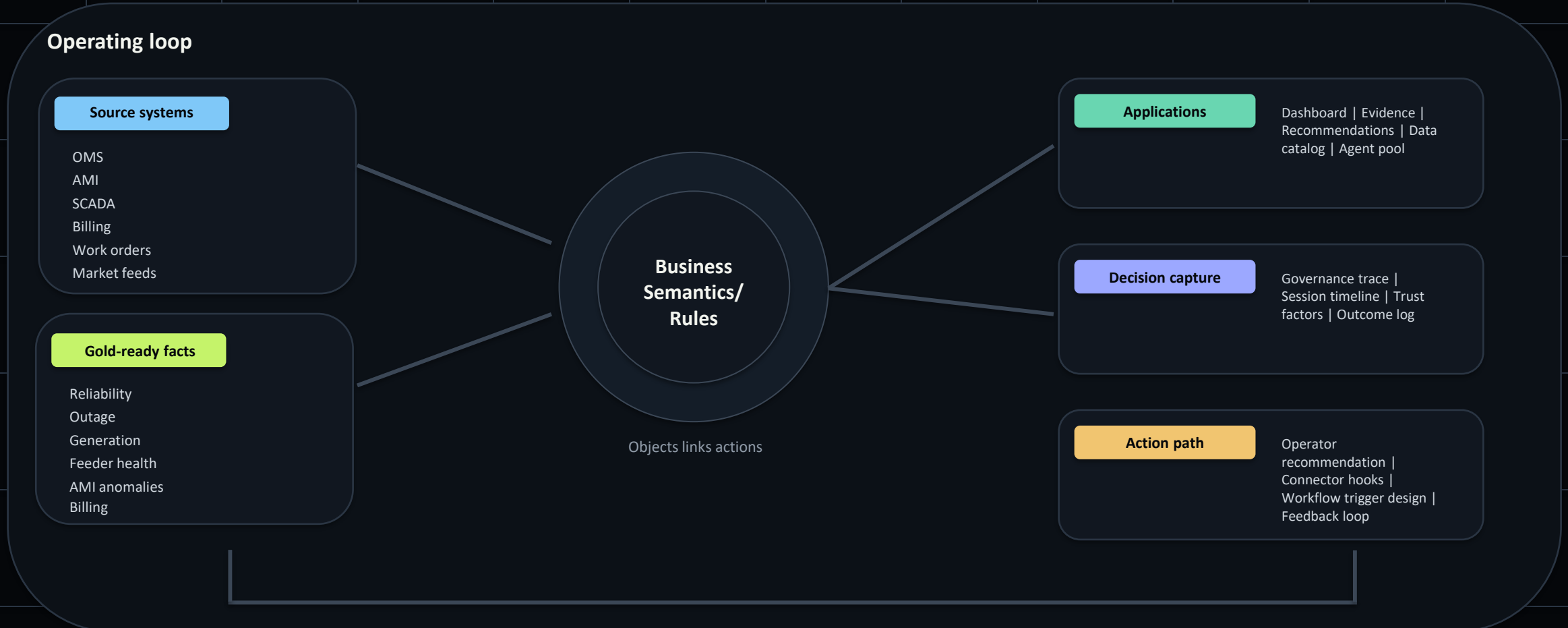
This is the actual application path from the current frontend and backend modules, not a theoretical architecture.



SOLUTION FLOW II

Source-to-Business Semantics/Rules-to-action operating loop

This is the broader solution loop: connect systems, model the world, run workflows, surface decisions, and carry feedback forward.



The UI already behaves like a command center, not a chatbot shell

The Product give operators multiple ways to inspect the decision: lead agent, supporting agents, evidence, ontologies, catalog, and governance trace.

CausalX command center

Question + explanation

What caused the forced outage at Unit UNIT_007 on February 1st, 2026?

Lead agent

Generation Forced Outage Agent

Root cause signal: boiler tube leak pattern surfaced from deterministic DAG traversal, grounded on generation performance intervals, unit telemetry context, and outage notes. Recommended next action is to schedule inspection and validate fuel quality controls.

Evidence

gold_fact_generation_performance_interval
forced_outage_hours > 0
unit note indicates boiler event

Recommendations

- Schedule inspection
- Check fuel quality protocol
- Open governance trace

Live agent execution

System Orchestrator

Generation Forced Outage Agent

Heat Rate Spike Agent

Modal workspaces exposed in the header

Governance

Agent Pool

Control Tower

Data Catalog

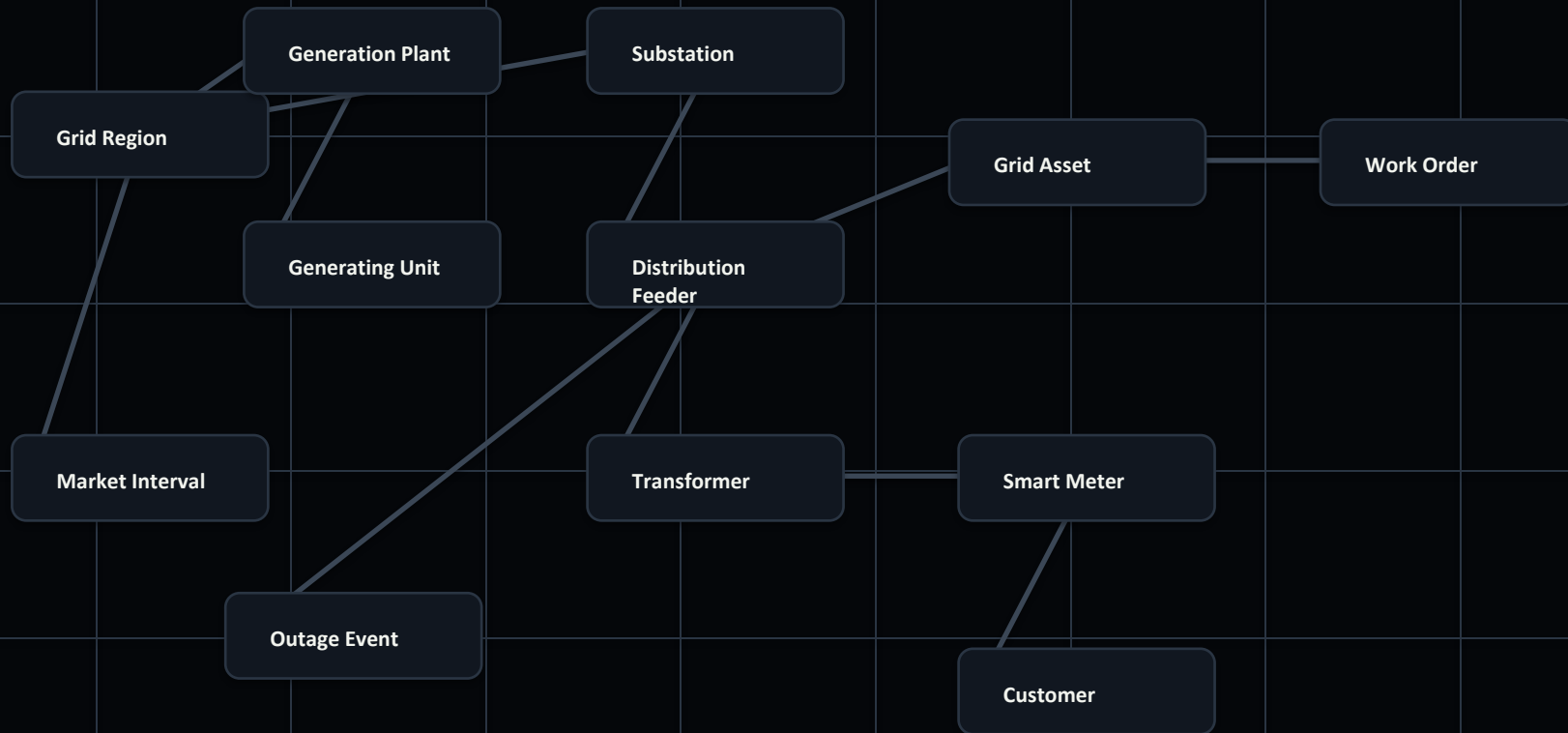
Ontologies

This matters commercially: the product already feels like a control room, not a generic assistant.

CT

7

A shared operating language connects the grid, the plant, the customer, and the action



Operational ontologies

Grid Reliability & Outage

Generation & Market

Distribution & Asset

Customer & Revenue

Operations & Safety

Standalone forecast extension

PREDICTIVE_MAINTENANCE

Commercial implication: ontology, business semantics is what lets one use case expand into a platform sale.

Specialized agents create an energy-native reasoning layer

The CausalX questions into domain agents rather than forcing one monolithic model to understand every operational problem.

How the agent layer works



Lead agent

1

The top agent is selected by keyword and context match against the agent catalog.



Supporting agents

2

Up to three supporting agents can be activated for cross-domain questions.



Deterministic DAG

3

Each agent carries a causal DAG, traversal map, ground-truth tables, and actions.



Persona output

4

Outputs are framed for specific operating personas: plant manager, reliability director, VP distribution, CFO.



Reusable logic

5

The same fabric powers catalog, ontology, governance, and recommendation views.

Commercially, this creates clean expansion paths: reliability -> distribution -> revenue -> operations -> finance.

Decision trace is a first-class product surface

The CausalX already exposes a governance dashboard and a detailed session trace, which is critical for regulated energy environments.

Governance session view

	Query submitted	Logged with timestamp and icon in SessionTrace
	Intent interpreted	Logged with timestamp and icon in SessionTrace
	Agent activation	Logged with timestamp and icon in SessionTrace
	Data retrieval	Logged with timestamp and icon in SessionTrace
	Causal tracing	Logged with timestamp and icon in SessionTrace
	Decision finalized	Logged with timestamp and icon in SessionTrace

Evidence package



Metric card

Evidence component parses key-value metrics and source table names.



Causal path

AgentExecutionFlow and causal pathway expose lead agent plus supporting logic.



Action rationale

Recommendations include confidence, rationale, and trade-off framing.

Why buyers care

- Reliability and outage decisions need a record that can be explained to regulators and operations leadership.
- Revenue protection and customer-impact actions are materially stronger when the system records data lineage and causality.
- The governance surface creates a direct differentiation angle versus dashboard-only analytics or opaque chat interfaces.

Utility gold data is already packaged for causal workflows

The strongest proof point in the repo is not generic bronze metadata. It is the utility-specific gold layer already wired into the product.

REGIONS

4

grid regions

PLANTS

10

generation plants

UNITS

16

generating units

SUBSTATIONS

10

grid substations

FEEDERS

14

distribution feeders

GOLD ROWS

24,547

demo records

Priority fact tables

AMI anomalies		6614
Generation performance		5920
Feeder health		5132
Reliability SAIDI/SAIFI		2976
Billing revenue		2966
Unit failure forecast		736
Outage events		102

Data design and purpose

- Reliability, outage, generation, energy balance, market exposure, feeder health, AMI anomalies, billing, inventory/maintenance, and failure forecast.
- Five dimensions support the model: region, plant, unit, substation, and feeder.
- Current refresh semantics in metadata: daily for analytics-ready gold, with connector patterns defined below it.
- The gold layer is what makes the causal experience believable in demos and pilot conversations.

Commercial talking point: the product will already backed by enough energy-shaped data to support a serious pilot story.

Turn outage events and feeder behavior into auditable root-cause decisions

This is the cleanest first wedge for a utility buyer: high pain, frequent decisions, measurable KPIs, and strong governance needs.

Buyer + workflow

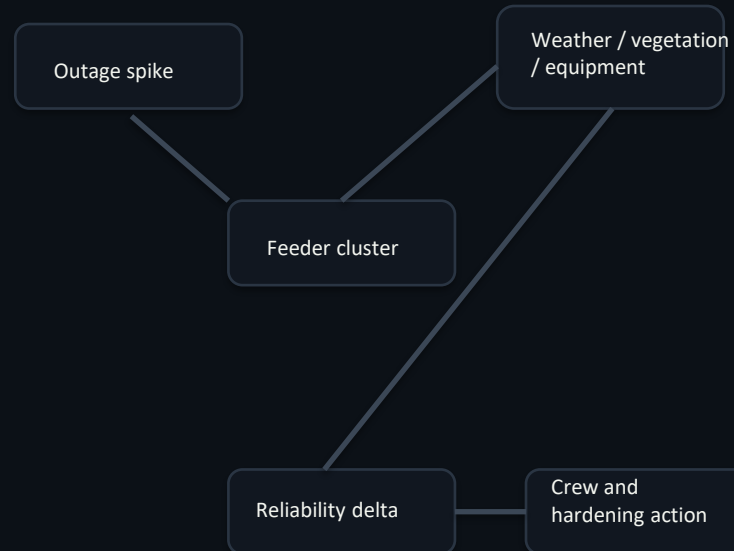
COO T&D / Reliability Director

- Question: Why did SAIDI worsen in the South Region last week?
- Lead agents: Grid Reliability Deterioration, Outage Cluster, Restoration Delay, Storm Readiness.
- Core evidence: reliability daily fact, outage events, feeder health, weather and vegetation context.
- Outcome: identify causal drivers, quantify customer impact, and recommend operational actions.

Recommended action pattern

1. Feeder hardening: Create WO bundle for top 5 repeat feeders
2. Vegetation trimming: Escalate tree-trim cycle for high-risk spans

Causal flow



Sample signals

Wildlife		28
Vegetation		22
Equipment Failure		19
Lightning		19

Highest average SAIDI in sample:
South Region at 91.14 minutes

75,571 customers affected across 102
outage events.

Combine unit diagnostics, failure forecasts, and market context in one operator flow

This wedge resonates with generation leadership because it connects mechanical reliability, heat-rate performance, and real dollar exposure.

Buyer + workflow

Plant Manager / VP Generation / Energy Manager

- Question: What caused the forced outage at Unit UNIT_007, and what is the forward risk?
- Lead agents: Generation Forced Outage, Heat Rate Spike, Predictive Maintenance, Congestion Cost.
- Core evidence: generation intervals, failure forecast, load and market exposure, plant and unit context.
- Outcome: maintenance action, dispatch view, and exposure framing in one answer.

Recommended action pattern

1. Schedule inspection: Create WO for root cause component
2. Fuel quality check: Escalate fuel testing protocol

Risk and performance signals

RISK UNIT

**UNIT
_007**

top forecasted unit

FAILURE

93.9%

failure probability

Predicted mode: Boiler Tube Leak
Days until failure: 6

Top generation plant:
Eastgate Coal Station
10,641,510 MWh

Largest congestion exposure magnitude:
REG_SOUTH at \$87K

Decision flow

Unit telemetry

Forced outage agent

Heat-rate agent

Market context

Maintenance + dispatch
action

Link AMI anomalies, billing variance, and field response into one revenue assurance loop

This wedge combines customer operations, revenue assurance, and operational discipline - often a compelling second or third GTM entry point.

Buyer + workflow

VP Revenue Protection / Ops / Billing

- Question: Where is revenue leakage highest, and what field action should follow?
- Lead agents: AMI Theft & Leakage, Billing Revenue Drop, Collections Bad Debt, OPEX Spike.
- Core evidence: AMI anomaly counts, suspected theft kWh, billing and collection rates, maintenance actuals.
- Outcome: prioritize investigations, tie revenue leakage to field activity, and frame operating cost trade-offs.

Recommended action pattern

1. Field investigation: Dispatch revenue protection crew
2. Overtime analysis: Review scheduling efficiency

Signal stack

THEFT

162,736

top 5 feeder kWh

COLLECT

97.0%

avg collection

Top system feeder:
Industrial Park Feeder (North Region)
51,688 suspected theft kWh

Top North Region feeder:
Industrial Park Feeder
51,688 suspected theft kWh

Highest maintenance actuals:
REG_SOUTH at \$1.22M

Operating loop

AMI anomalies

Billing variance

Field cost / backlog

Leakage prioritization

Investigation action

Outcome +
governance

DEMO SIGNALS FROM THE SHIPPED DATA

The repository already contains enough operating signal to support a serious story

OUTAGE EVENTS

102

individual outage records

OUTAGE HOURS

296

aggregate duration

AFFECTED CUSTOMERS

75,571

sample impact volume

COLLECTION RATE

97.0%

billing average

HIGH-RISK UNITS

2

high / critical forecast

GOLD ROWS

24,547

demo dataset size

Reliability by region

South		91
North		91
East		90
West		90

Top outage causes

Wildlife		28
Vegetation		22
Equipment Failure		19
Lightning		19
Weather - Ice Storm		7

Hotspot feeders and risk

Top feeder hotspot:
Industrial Park Feeder (North Region)
51,688 suspected theft kWh

Top forecasted failure:
UNIT_007 / Boiler Tube Leak
93.9% failure probability

Highest congestion exposure magnitude:
REG_SOUTH at \$87K

Sell the operating loop, land with a wedge, expand by ontology

Reliability command center

Buyer: COO T&D / Reliability Director

Pilot proof: SAIDI, SAIFI, CAIDI, outage cluster RCA, customer impact, restoration actions

Expansion: distribution asset health, vegetation, storm response, regulatory reporting

Plant performance cockpit

Buyer: Plant Manager / VP Generation / Energy Manager

Pilot proof: forced outage RCA, heat-rate degradation, failure forecast, market exposure framing

Expansion: dispatch optimization, renewable forecast, maintenance strategy, trader workflow

Revenue protection and field ops

Buyer: VP Revenue Protection / Billing Ops / VP Operations

Pilot proof: leakage hotspots, collection deterioration, investigation prioritization, OPEX visibility

Expansion: bad debt, field operations, spares, vendor performance, finance decomposition

Message discipline: position CausalX as a governed decision operating system for energy, not as a generic AI assistant layered on top of dashboards.

Run a fast wedge pilot, then industrialize the action layer

Phase 1

Weeks 1-4

Stand up data, validate entity mapping, finalize pilot KPIs and operating personas.

Phase 2

Weeks 4-10

Tune lead agents, evidence cards, governance views, and executive review outputs.

Phase 3

Weeks 10-13

Run production-like decision loops with operators and capture hard value cases.

Phase 4

Post-pilot

Add connector-backed actions, writeback hooks, and adjacent ontology packages.

WHY CAUSALX

Built for energy teams that need cause, evidence, and action in one system

● Model the world

Ontology and utility gold data turn disconnected systems into one operating language.

● Reason with accountability

Agent DAGs, evidence cards, and governance traces make the product credible to operators.

● Land a wedge, expand a platform

Reliability, plant performance, and revenue protection create practical entry points for broader platform adoption.

Recommended first offer: a 6-week reliability or plant-performance pilot with governance and evidence as explicit value markers.