

Grid Intelligence

AI-Powered Distribution Grid Intelligence for Modern Utilities

The distribution network is absorbing a decade of load growth in the span of a few years, as AI compute, new data centres and electric-vehicle charging arrive together. Distributed generation now pushes power back up circuits that were only ever designed to carry it in one direction, and increasingly severe weather tests assets that are already operating well beyond their intended service life.

Impresa Grid Intelligence brings AMI, SCADA, GIS, OMS, OCPP and weather data together into a single live, semantic model of the distribution network, and runs eight purpose-built intelligence services on that shared foundation. The platform reveals emerging failures, hidden losses and demand strain well before they impact the grid, ranks the day's priorities by operational and financial impact, and pairs each one with a clear recommended action.

Key Features

- Outage Intelligence
- Transformer Load Intelligence
- Demand & Peak Intelligence
- Load Balance Intelligence
- Power Quality Intelligence
- EV Intelligence
- Network Load Forecasting
- Grid Reliability



Industry Challenges

Distribution operators are being asked to carry more load, absorb more distributed energy and hold reliability steady, often with very little visibility into what is happening below the substation. Calendar-based maintenance cycles and disconnected operational systems leave scarce room to see stress building on the network before it becomes an incident in the field



Load from electrification, data centres and distributed energy is outpacing available network capacity



Loading on transformers and feeders below the substation remains largely unmeasured



Calendar-based maintenance overlooks the specific assets that are closest to failure



Technical losses from phase imbalance, THD and low power factor quietly erode efficiency



Voltage and power-quality problems tend to surface only once customers complain



Exposure to extreme weather and storm-driven outages continues to rise

Learn More

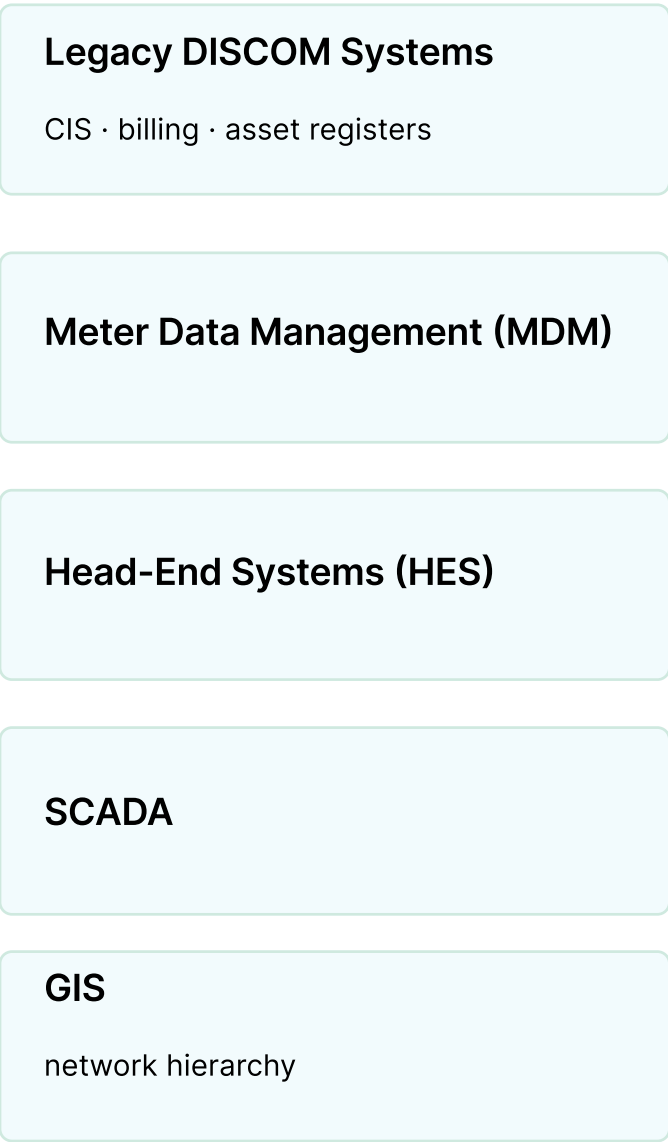
To schedule a live demo or find out more information, visit www.impresa.ai or call +1 510 824 3255

AI-Powered Core Intelligence Capabilities

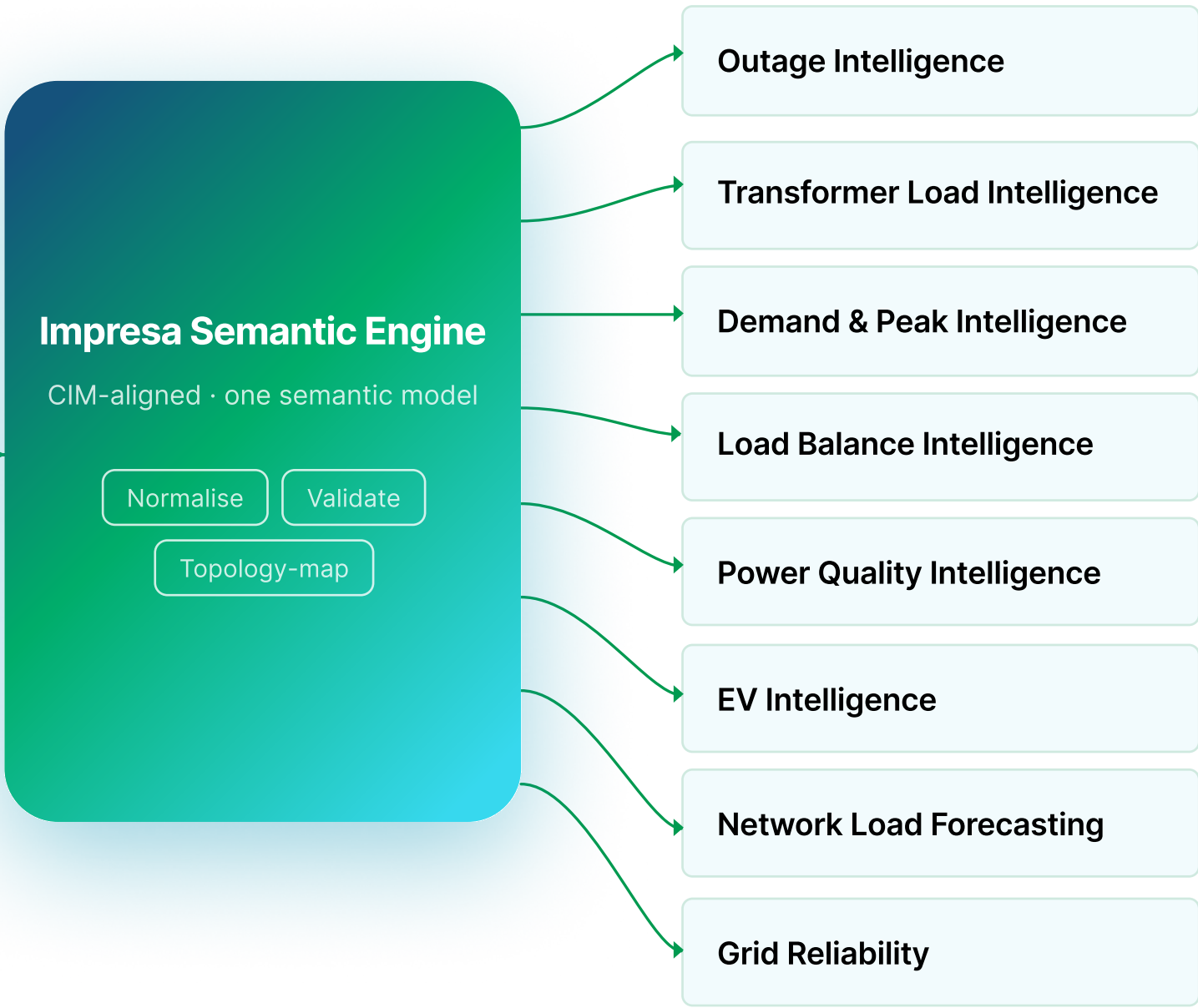
One Semantic Foundation, Eight Intelligence Services

Raw data from legacy DISCOM systems, MDM, HES, SCADA and GIS flows into the Impresa Semantic Engine, where it is normalised and mapped onto the network topology to form a single CIM-aligned model. Each of the eight services then draws the governed, purpose-fit data it needs from that shared model, so every insight reconciles against the same version of the grid

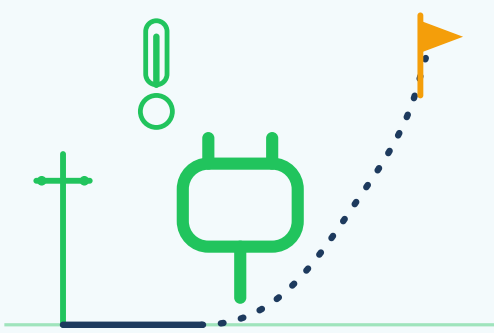
DATA SOURCES



INTELLIGENCE SERVICES

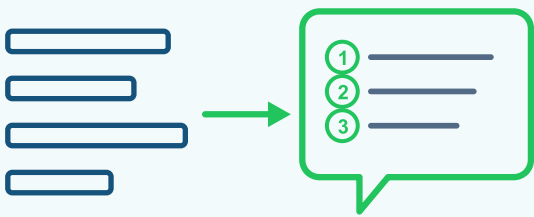


BUILT FOR THE GRID



Predictive & Forecasting Intelligence

Utility-trained models run inside every service, covering outage risk, transformer thermal ageing, demand and EV adoption. The same platform that maps today's hotspots is therefore already projecting next year's load. Seven-day feeder-risk scoring and pre-storm crew staging turn that foresight into a concrete plan before the first fault occurs.



The Impresa Language Model

A dedicated AI layer, grounded in a language model trained on utility data, reads the same semantic model as the services themselves. It explains every ranked risk in operational language, distinguishes clearly between measured and modelled figures, and distils thousands of raw signals into a short, prioritised decision queue for the operator.

Business Benefits

15–30%

Reduction in outage duration (SAIDI)

up to 40%

Fewer unplanned asset failures

10–20%

Lower maintenance cost

30–40%

Faster fault location & restoration

- Shift maintenance from fixed calendars to the true condition of each asset
- Defer reinforcement by re-timing demand before committing capital
- Recover technical losses caused by phase imbalance and low power factor
- Give control-room teams a single, ranked view of the whole network

Learn More

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Supported Utility Use Cases



Outage & Restoration

Last-gasp outage detection with topology-based ghost-event filtering, predictive outage risk, and SAIDI and SAIFI restoration analytics that hold reliability reporting to a defensible standard



Asset & Capacity Planning

Transformer utilisation and headroom, thermal-ageing and remaining-life ranking, and evidence-based decisions on new EV, DER and load connections.



Demand & Load Management

Real-time peak monitoring, pre-emptive load transfers ahead of a breach, and demand forecasts that separate organic growth from EV-driven load



Power Quality & Losses

Compliance against EN 50160 and ANSI C84.1, harmonic and phase-imbalance analytics, and technical-loss attribution across the low-voltage network.

Related Products

- Grid Intelligence
- Smart Meter Intelligence
- Transformer Load Monitoring
- Outage Intelligence
- Revenue Intelligence
- Customer Intelligence
- Sustainability Intelligence
- Impresa Meter Data Hub
- Impresa Language Model

Modern Enterprise Platform

AI-Powered Energy Intelligence Architecture

☁ Cloud Native Architecture

🔗 Semantic Data Model

🌟 Utility-Trained AI

⚡ Near-Real-Time Map Views

🛡 Automated Alerts & Ticketing

📄 Open APIs

🔗 Multi-Tenant & RBAC

📈 Scalable to Millions of Meters

Why Utilities Choose Impresa

Compatible with leading utility enterprise systems, and grounded in open standards:



Purpose-built for distribution grid operations



A single semantic model shared across all eight services



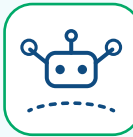
Reveals both visible failures and silent, unmetered losses



Explainable AI and language models trained on utility data



Near-real-time geospatial drill-down, from region to customer



Grounded in established IEEE, IEC, EN and ANSI standards



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