ENERGY MANAGEMENT SYSTEM

Every watt on your site, on one screen.

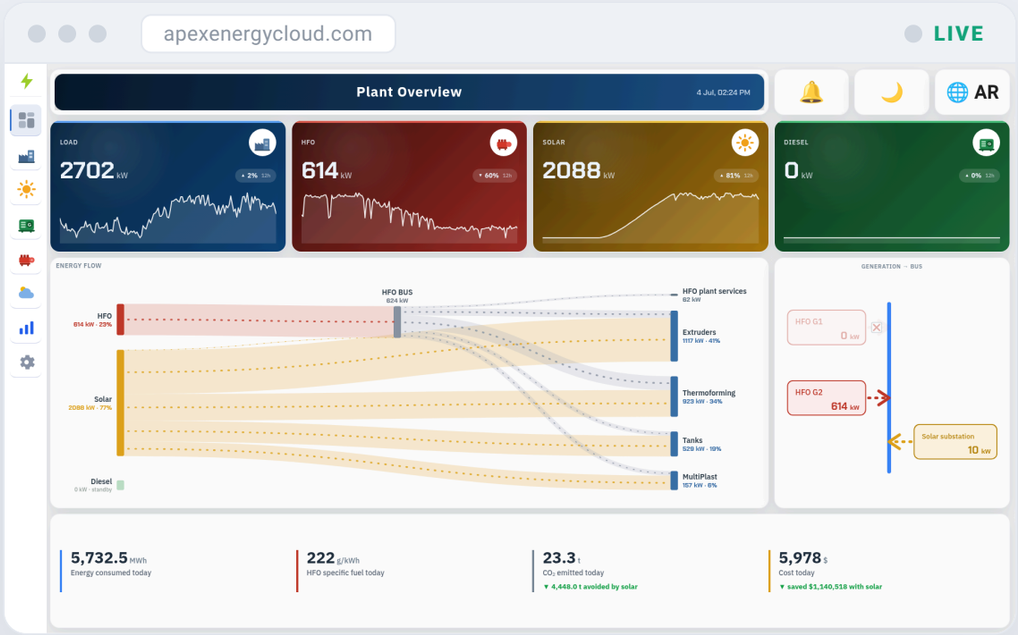
Apex Energy Cloud brings your generators, solar, batteries and loads onto one live dashboard. Readings arrive every second, and you can control the equipment from anywhere.

7
Asset classes managed

46
Inverters under watch

1 s
Edge polling cadence

2-way
Monitor & control



THE CHALLENGE

Your energy assets don't talk to each other

Most sites run generators, solar, batteries and the grid side by side, and each one comes with its own controller and its own screen. Nobody sees the full picture, and problems are found late.

Every device speaks differently

Each vendor uses its own protocol. The data exists, but it sits in a dozen separate places.

No live picture

Faults, low fuel and battery wear are discovered on a site visit, after they have already cost money.

Manual control

Starting a genset or switching a battery bank still means sending someone to the panel.

THE APEX PLATFORM

One platform, end to end

Apex covers the whole chain: it reads the meters, gathers the data in one place, shows it live, and carries your commands back to the equipment.

SENSE

Read everything

Any meter or controller, any brand. Readings are cleaned up on site before they go anywhere.

STREAM

See it live

Data reaches your dashboard within seconds, over an encrypted link.

STEER

Remote control

Start, stop and switch modes straight from the dashboard.

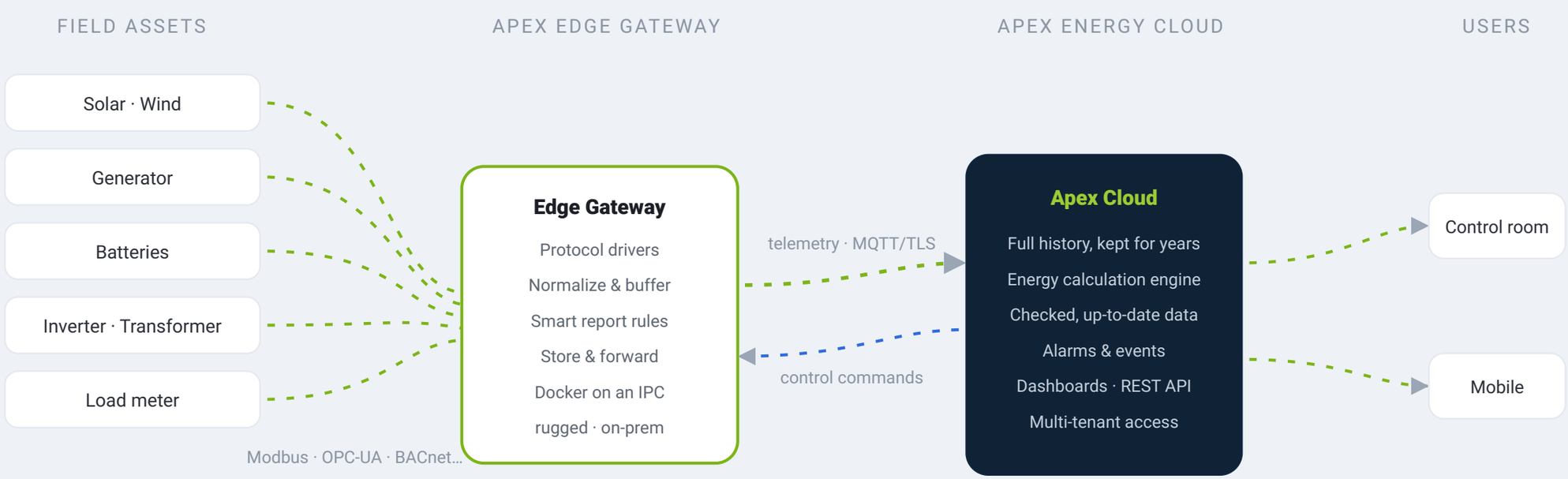
SCALE

Any site, any size

Works for a single site or a whole fleet, without redesigning anything.

HOW IT WORKS

From the field sensor to your screen



Telemetry uplink Control downlink The site dials out to the cloud. Nothing from outside can dial in.

EDGE + CLOUD ARCHITECTURE

A computer on site, a cloud behind it — each does what it does best

A small industrial PC on site handles the fast local work: reading the meters and controlling the equipment. The cloud keeps the history, the dashboards and the analysis. If the internet drops, the site keeps running on its own.

THE EDGE · ON-SITE

Industrial PC (IPC)

- Fanless, rugged **IPC** — DIN-rail / panel-mount, no moving parts
- Runs the **Apex Edge Gateway** in Docker
- **Sub-second** polling & local control loops
- **Store-and-forward** buffering through outages
- Keeps running if the **cloud link drops** — dials out only

THE CLOUD · ANYWHERE

Apex Energy Cloud

- Brings **every site and every signal** together
- Totals computed from **checked, current readings** only
- Years of **history, rules, alarms** & events
- **Dashboards + mobile**, anywhere
- **Remote setup** — add devices without a site visit
- **Per-user access** — each person sees what they should

Resilient
Keeps working offline

Fast
Local control under a second

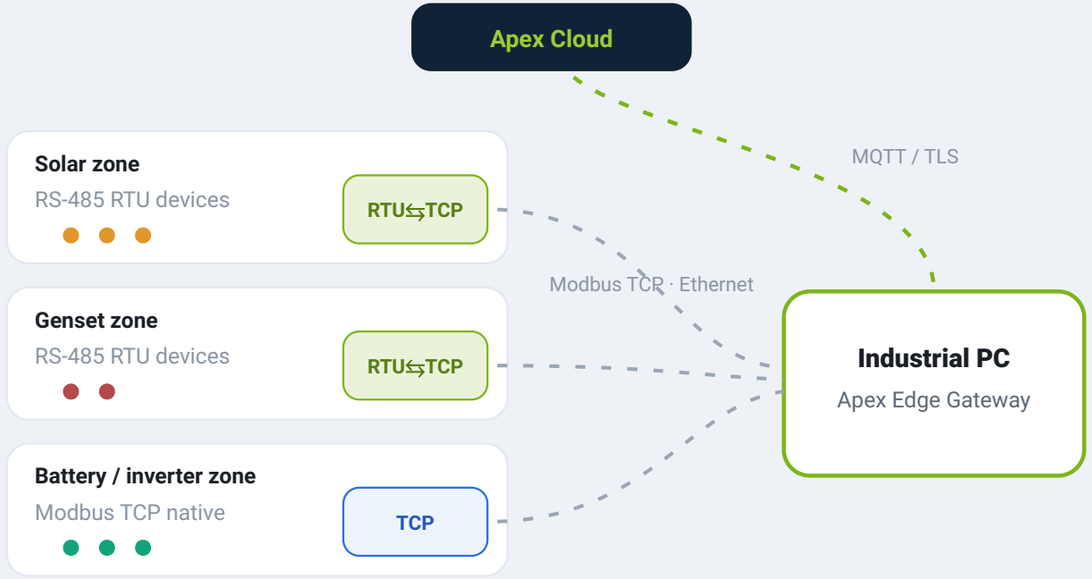
Secure
Encrypted, dials out only

Scalable
Add sites as you grow

DECENTRALISED BY DESIGN

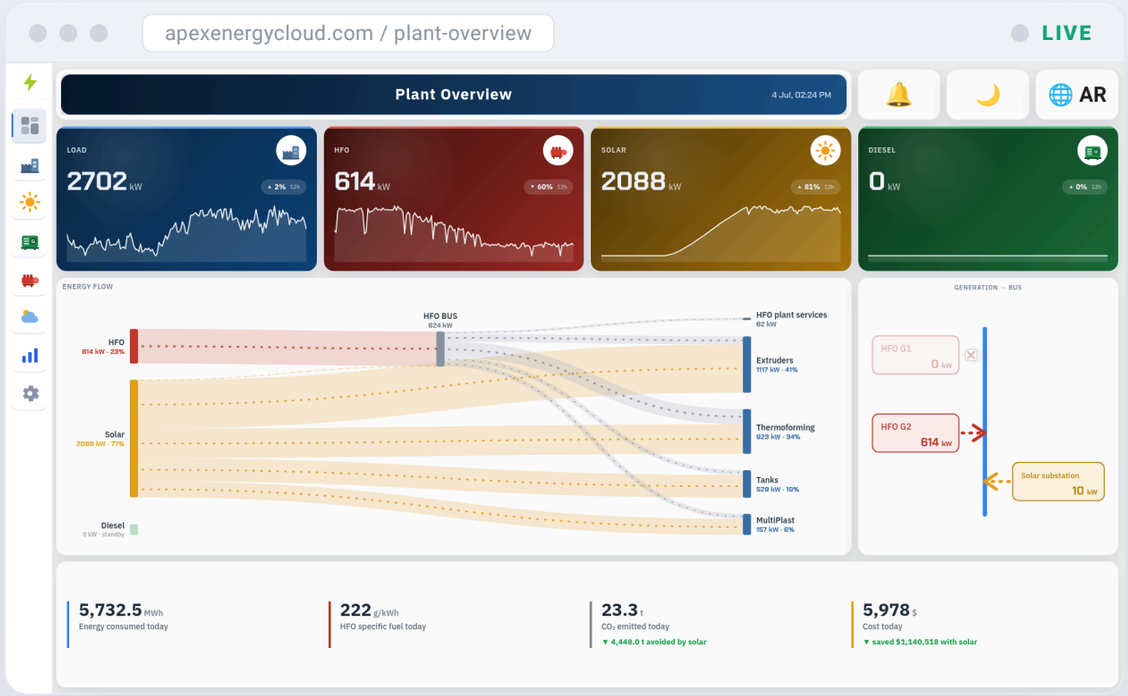
No single point of failure

Instead of pulling every cable back to one panel, each equipment zone gets its own small gateway. The gateways connect over the plant network, so a problem in one zone never takes down the others.



- **Fault isolation** — one gateway drops, the rest keep running
- **Less cabling** — devices chain together locally; one network run home
- **Any brand** — old and new equipment can share a zone
- **Grow zone by zone** — add a gateway to add an equipment group
- **Local buffering** — each gateway holds its data through dropouts
- **Easy retrofits** — wire a new zone without touching the rest

LIVE SYSTEM · PLANT OVERVIEW



The whole plant on one screen

A real Apex installation at an industrial plant. The diagram shows energy moving from each source to each production area, live.

1. **2,702 kW** total load, split live across HFO, solar and diesel
2. **Energy flow** — power traced to extruders, thermoforming, tanks & services
3. **Generation buses** — each genset's output and the solar contribution, unit by unit
4. **Cost, CO_2 & fuel per kWh** totalled for the day, automatically

LIVE SYSTEM · SOLAR PLANT

46 solar inverters, watched one by one

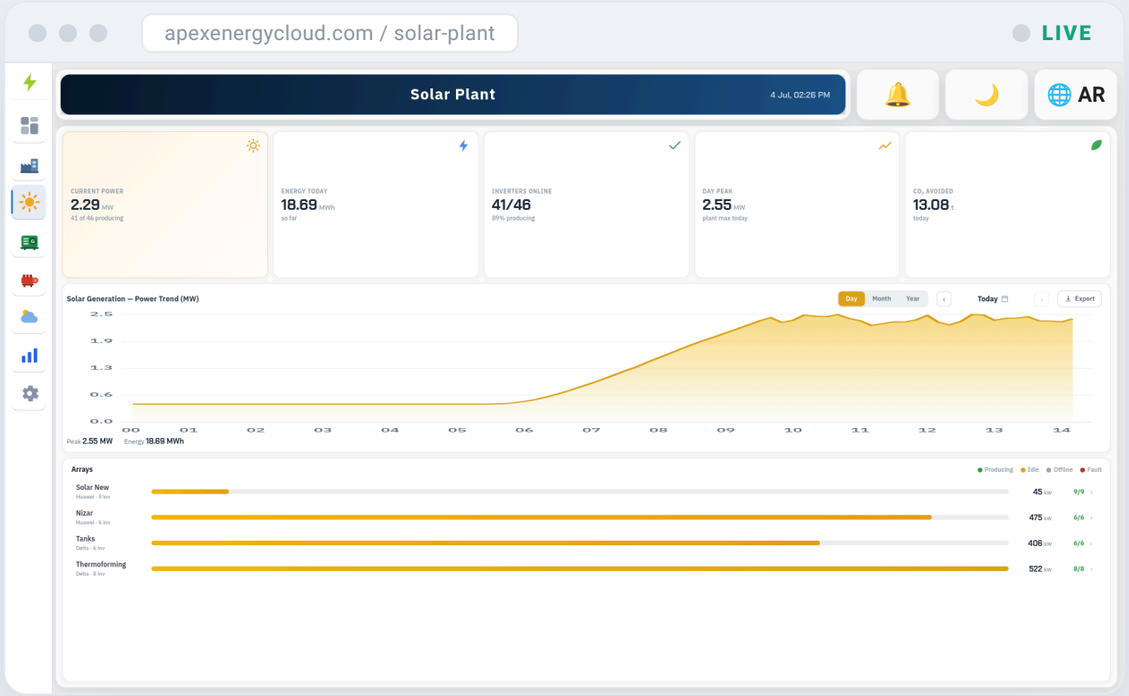
Every inverter and every kilowatt-hour, with the day's production curve and the CO_2 it saved.

18.69 MWh
Generated by mid-afternoon

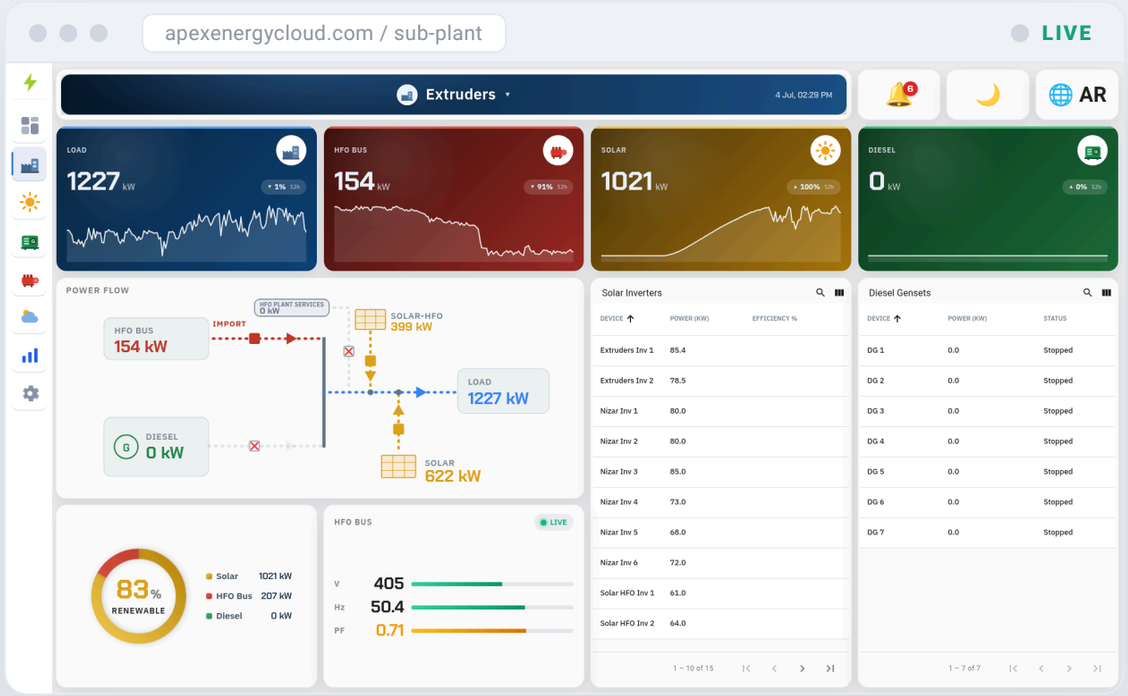
2.55 MW
Day peak

13.08 t
CO_2 avoided today

- Per-array status
- Inverters online / fault
- Day · month · year



LIVE SYSTEM · SUB-PLANT DETAIL



Zoom into any production area

From the plant view, step into a single area and see its own power flow, its energy mix and the equipment behind it.

1. **Local power flow** — supply, solar, diesel and load for this area alone
2. **Solar inverters table** — power and efficiency, inverter by inverter
3. **Diesel gensets** — each unit's power and whether it is running
4. **Solar share** & supply quality (voltage, frequency, power factor) at a glance

WHAT APEX MANAGES

Seven kinds of equipment, all covered

Each one reports the readings that matter for running it and keeping it healthy. The controllable ones accept commands back.

GENERATION

Solar

Irradiance, voltage, current, power & module temperature.

GENERATION

Generator

Fuel, oil temp, output, run-hours · remote start/stop.

STORAGE

Batteries

6 banks · SoC, temp, charge/discharge, cycle count · mode control.

CONVERSION

Inverter

3-phase in/out, per-phase power, current & temp · mode control.

DISTRIBUTION

Transformer

Per-phase V/I, day & night energy · per-phase mode control.

LOAD

Consumption

3-phase load, power demand & daily energy.

GRID

Mains / Export

Import/export balance & power quality at the point of common coupling.

EDGE INTELLIGENCE

Send what matters, skip the noise

The gateway reads every device each second, but is selective about what it sends up. Important events go instantly; a temperature that hasn't moved doesn't clog the line.

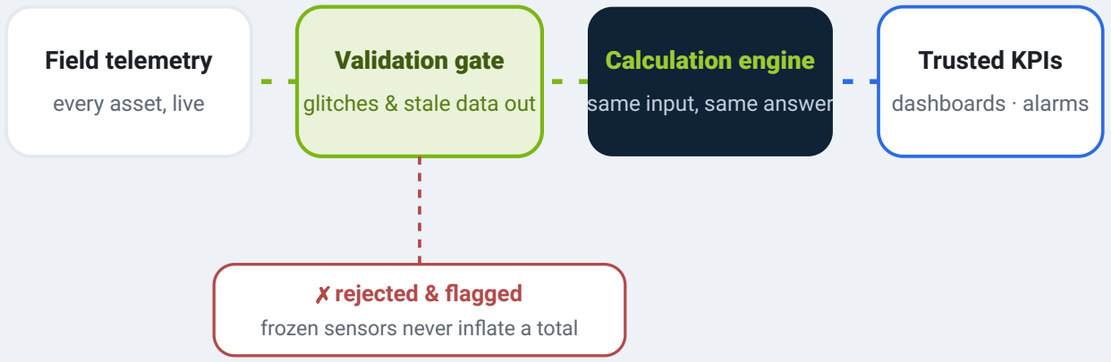
- **Instant** — faults, status and mode changes go up the moment they happen
- **Regular** — fast-moving readings like voltage & power stream at a set pace
- **On change** — slow readings (temperature) report only when they move
- **Never lost** — data is stored locally through outages and sent when the link returns

Where Apex lives
Edge gateway & meters installed in the plant's control cabinet.

TRUSTWORTHY DATA

Numbers you can put your name on

A dashboard is only as good as the arithmetic behind it. Apex checks every reading before using it, and computes every figure the same way everywhere — on screen, in alarms and in reports.



- **Counted once** — the system knows how the plant is wired, so nothing is ever double-counted in a total
- **No stale readings** — a frozen or silent sensor is left out and flagged, never left quietly padding a total
- **Checked at the door** — impossible readings and sensor glitches are thrown out before they count
- **Consistent** — the same readings always give the same answer, and the calculations themselves are tested

ALWAYS-ON ENERGY AUDITING

An energy audit that never stops

A consultant audits your plant once a year and leaves. Apex watches it every second, and turns the raw readings into the handful of figures that actually drive decisions.

EFFICIENCY

Energy per unit produced

kWh per unit of output — how much energy your product really costs.

GENERATION

Fuel per kWh

How efficiently each genset turns fuel into power, live.

MIX

Solar share

How much of the load solar is carrying, hour by hour.

QUALITY

Power factor & demand

Stay ahead of utility penalties and peak charges.

COST

Cost per kWh

By source — grid, genset or solar — as it happens.

CARBON

CO_2 emitted & avoided

Tracked automatically, ready for reporting.

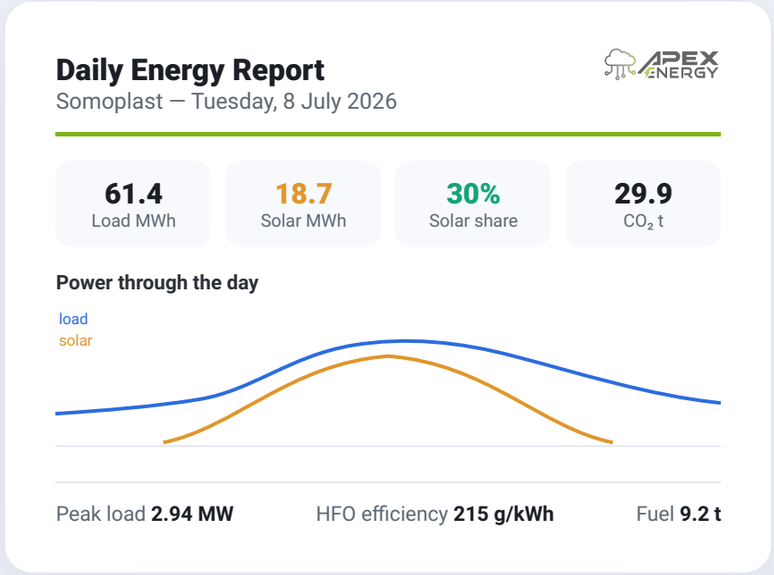
Flagged the moment it happens: off-shift loads left running, idling equipment, drifting power factor, demand spikes and underperforming inverters.

AUTOMATIC REPORTS

The day's numbers, in your inbox every morning

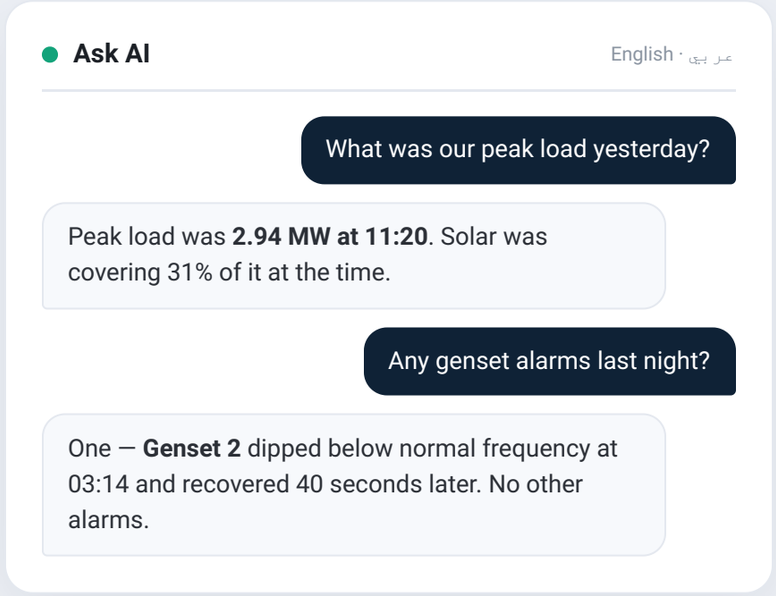
Every night the platform writes a PDF report of the day just ended and emails it out by itself — nobody has to remember to run it. The same report is one click away for any day, month or year.

- **Daily, monthly & yearly** — the same clear layout for any period
- **What matters on one page** — energy by source, cost, CO_2 and genset efficiency
- **The day's story** — the power curve plus highlights like peak load and best solar hour
- **History at your fingertips** — browse any past day in the dashboard, export to Excel



Emailed overnight, ready before the morning shift

ASK AI



Have a question? Ask the plant.

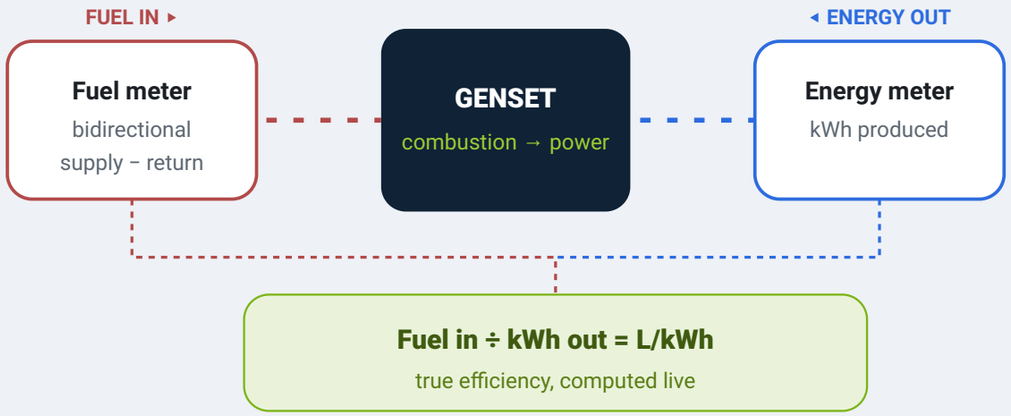
A chat assistant built into the dashboard. Ask about any figure, machine or alarm in plain English or Arabic, and it looks the answer up in the plant's own records before replying.

- **Any question, any period** — "How much solar did we produce last Tuesday?"
- **Answers from the data** — every figure is looked up and calculated, not guessed
- **Knows the whole plant** — machines, meters, alarms and the full history
- **Always there** — its own tab in the dashboard, on desktop and phone

TWO SIDES OF EVERY SIGNAL

Each meter pays for itself twice

The same reading tells you two things: how well a process is running, and how healthy the machine behind it is. Metering both **what goes in and what comes out** is where it really pays off.



- **Real fuel efficiency** (L/kWh) — measured on your engine, not taken from the datasheet
- **Theft & leak detection** — fuel gone with no kWh to show for it
- **Early warning** — a slowly rising L/kWh means wear, long before a breakdown
- **Better decisions** — the real cost per kWh of genset vs solar vs grid
- **Right loading** — keep the engine in its efficient 75–85% band

Performance side

Output, energy per unit and efficiency, compared across machines and shifts.

Health side

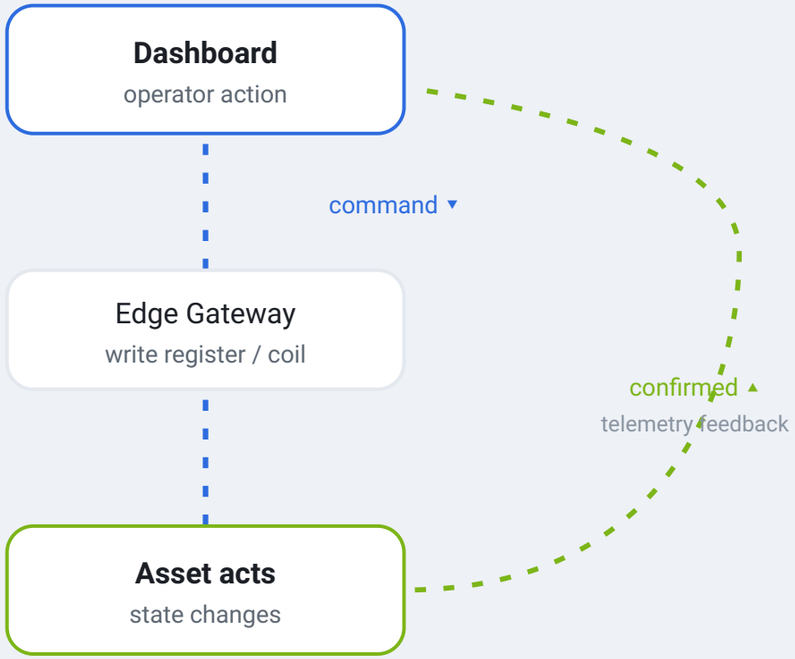
Temperature, run-hours and fuel trends that catch wear before it becomes a breakdown.

REMOTE CONTROL

Don't just watch it — run it

Control works both ways. Commands travel from the dashboard back to the equipment over the same secure link that brings the data up.

- **Remote start / stop** — gensets, solar, wind and every battery bank
- **Mode changes** — inverter, transformer phases, battery charging
- **Automatic rules** — equipment can be started or stopped by rules, no one at a desk
- **Logged** — every command recorded: who sent it, what it did, when



CONNECTIVITY

Works with what you already have

Today the plant runs on Modbus. When EV chargers, building systems or smart meters arrive, the drivers are already on the shelf.

Modbus
TCP & serial · live today

OPC-UA
Industrial SCADA

BACnet
Building / HVAC

OCPP
EV charging

KNX
Smart building

MQTT
IoT sensors

SNMP
Network gear · UPS

CAN
BMS / vehicle bus

REST · FTP
3rd-party APIs

+ more
ODBC · BLE · serial

Deployed & supported
Apex engineers commission the system on site, then manage it remotely.

INSTALLATION & TRUST

Installed on site, managed remotely

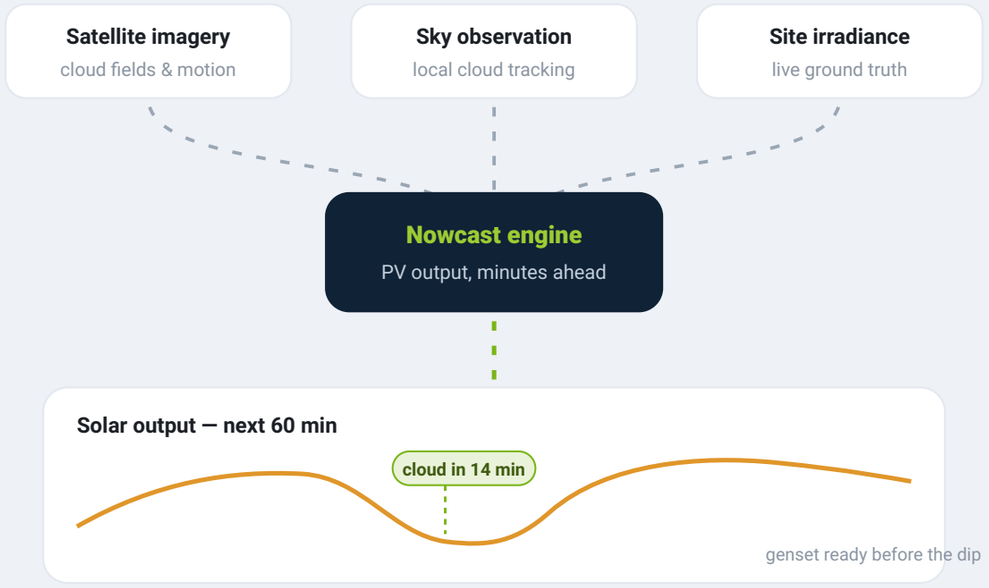
- **Secure** — encrypted connection; the site dials out, nothing dials in
- **Self-recovering** — the on-site software restarts itself if anything fails
- **No repeat visits** — new devices and settings are added from the cloud
- **Shared safely** — many sites and customers on one cloud, each seeing only their own
- **No data lost** — readings are held on site through outages and sent afterwards

SOLAR INTELLIGENCE · NOWCASTING

See the cloud before it hits your panels

One passing cloud can cut solar output in half in under a minute, and every kilowatt it takes away has to come from the gensets instantly. Apex combines satellite images, a sky camera and the site's own sensors to predict solar output minutes to hours ahead.

- **Minutes of warning** — cloud shadows are tracked and timed before they reach the site
- **Ramp forecasts** — how fast solar will fall and recover
- **Genset pre-start** — started just before the dip, not left running all day as insurance
- **Less fuel burned on standby** — you no longer need to guard against what you can see coming



INTELLIGENCE LAYER · FORECASTING

Run today with tomorrow's information

Apex predicts both what the site will generate and what it will consume — from the next minute out to the next day — and plans the generators around it.

MINUTES AHEAD

Cloud warnings

Solar dips seen coming, gensets started just in time.

HOURS AHEAD

Generation forecast

Weather forecasts shape the day's genset schedule.

DAY AHEAD

Load forecast

Consumption learned from your own history — shifts, seasons, production plans.

ALWAYS ON

Planning ahead

Forecasts become actions: which gensets run, when batteries charge, how much fuel to order.

Less diesel idling
Run only the reserve you actually need

More solar used
Confidence to lean on the sun

Steadier plant
Swings handled before they happen

WHERE APEX IS GOING

From watching the plant to running it for you

The platform is live and working every day. Here is what it already does, and where it goes next.

RUNNING TODAY

Delivered

- Live plant, solar & genset dashboards
- Automatic daily, monthly & yearly reports by email
- Ask AI — plain-language answers from plant data
- Alarms on supply quality, sent as they happen

NEXT

Smarter operation

- Load & solar forecasting
- Early fault detection from trends
- Peak-shaving automation
- Genset scheduling suggestions

GROWTH

Wider reach

- Faster onboarding of new sites
- EV charging control
- Building & HVAC loads
- Native iOS / Android apps

VISION

Autonomy

- A full digital copy of the plant for what-if testing
- Power trading between sites
- A microgrid that corrects itself
- Open access for partners

APEX ENERGY

Your whole plant, in your hands.

Every asset on one screen, every command a click away, a report in your inbox each morning — and a plant you can simply ask.

- Live monitoring & control
- Daily reports by email
- Ask AI, in English or Arabic

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