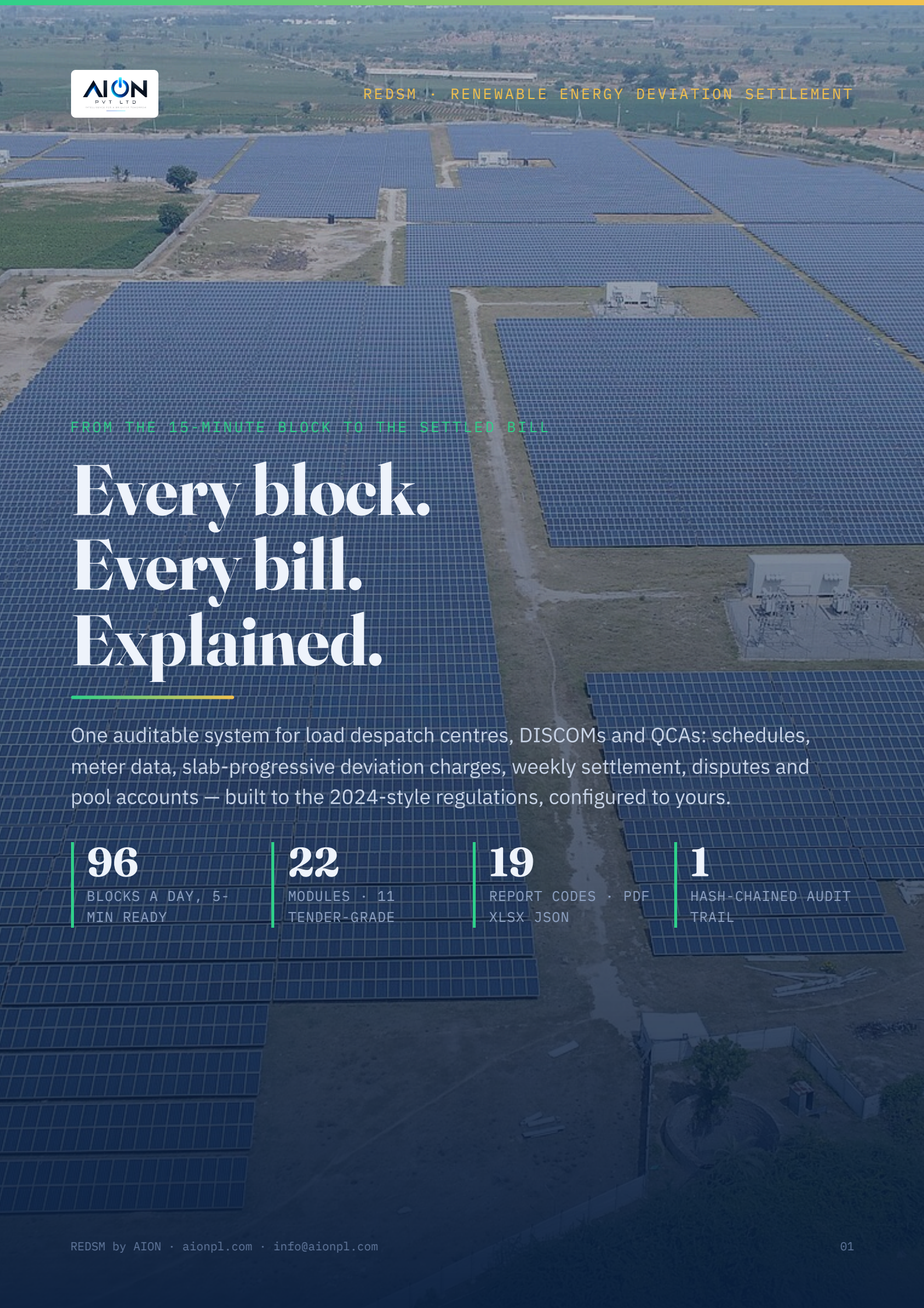


FROM THE 15-MINUTE BLOCK TO THE SETTLED BILL

Every block. Every bill. Explained.

One auditable system for load despatch centres, DISCOMs and QCAs: schedules, meter data, slab-progressive deviation charges, weekly settlement, disputes and pool accounts — built to the 2024-style regulations, configured to yours.

96
BLOCKS A DAY, 5-MIN READY

22
MODULES · 11 TENDER-GRADE

19
REPORT CODES · PDF XLSX JSON

1
HASH-CHAINED AUDIT TRAIL

WHY REDSM

The regulation moved to slabs and 15-minute blocks. Most settlement desks are still on spreadsheets.

Forecasting-and-scheduling and deviation-settlement regulations for wind and solar now require every generator — through its QCA — to schedule 96 blocks a day, revise within caps, and settle deviation against effective-dated band tables. The 2024 amendments replaced flat single-band charges with slab-progressive charges and, where applicable, multipliers of a contract or market-clearing rate.

That is a weekly cycle of schedule intake, meter reconciliation, band lookup, frequency-linked adjustment, bill publication, dispute handling, pool-account accounting and regulator reporting — across thousands of pooling substations and QCAs. Done by hand it is slow, contestable and impossible to audit end to end.

REDSM replaces the spreadsheet chain with one system of record. Every schedule revision, meter block, band rate, bill line and adjudication is stored, versioned and hash-chained — so a bill can be explained line by line, months later, to a generator, a regulator or an auditor.

5,000
QCAS PER STATE DEPLOYMENT

9,999
POOLING SUBSTATIONS

16
REVISIONS A DAY, CAPPED IN CODE

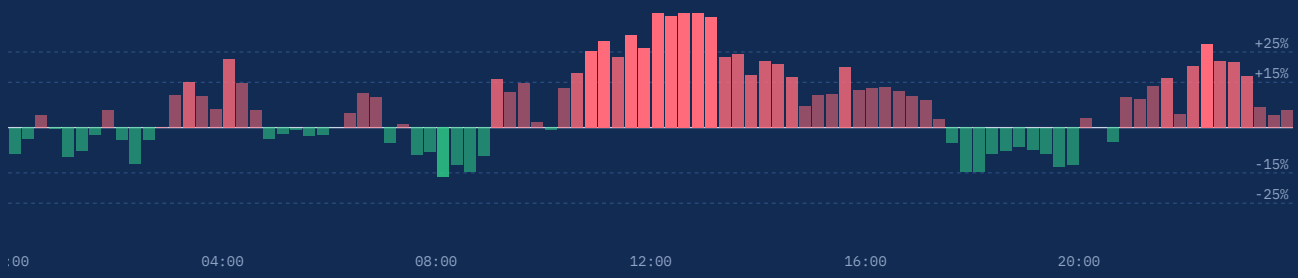
THE SETTLEMENT WEEK, AS REDSM RUNS IT

1. **AvC & schedule intake** — API, CSV, XLSX, SFTP, pooled QCA files; revision numbering and caps.
2. **Block promotion** at +5 s after every boundary; curtailment, moderation, day finalisation.
3. **Meter & telemetry ingestion** — main vs check mismatch, recheck, missing blocks, coverage matrix.
4. **Deviation per block** → slab or band → frequency multiplier, on the table in force that day.
5. **Weekly bill** per PSS × QCA, one line per day per direction; surcharge accrual; corpus auto-adjust.
6. **Disputes, adjudication, pool account, regulator reports** — every step on the audit chain.

Wind, solar and hybrid pooling substations — scheduled, metered and settled in one place.

REGULATION ENGINE

Rates are data, not code. The engine follows the order in force on the block date.



over-injection · under-injection · slab boundaries ±15 % · ±25 %

One day, one pooling substation: deviation of injected against scheduled energy per 15-minute block. Illustrative shape, not a customer's data.

Two settlement mechanisms, switchable

Scheduled-generation basis (2024-style amendment, default) and available-capacity basis (2018-style) run side by side. A comparison view shows the delta for any PSS before a state switches.

Slab-progressive charge engine

Deviation is integrated across slabs — the first 15 % at one rate, the next 10 % at another — under two pricing modes: flat ₹/kWh per slab, or a multiplier of a contract or market-clearing rate, split solar/hybrid vs wind, over vs under. Earlier block dates keep the legacy single-band computation so historical bills stay reproducible.

Frequency-linked multipliers

15-minute grid frequency is banded and an effective-dated multiplier is applied by direction.

< 49.85	49.85–49.95	**49.95–50.05**	50.05–50.15	> 50.15 Hz

Regulation watch

A weekly sweep fingerprints the regulator's archive, extracts numeric changes — band rates, multipliers, surcharge, block minutes, revision caps — and files change proposals. Nothing changes until an operator applies one, and the application itself is written to the audit chain.

WORKED EXAMPLE · ONE BLOCK

2.0 MW scheduled, 2.4 MW injected (+20 %)

SLAB	ENERGY	RATE	CHARGE
0–15 %	75 kWh	₹0.50	₹37.50
15–25 %	25 kWh	₹1.50	₹37.50
Block total			**₹75.00**

Illustrative seed rates. Actual tables are loaded per state and per effective date. Legacy flat-band on the same block: 100 kWh × ₹1.50 = ₹150.

Weekly bill mechanics

One bill per PSS × QCA per settlement week; a line per day per direction; bill explanation drills from total to block; what-if and mechanism-compare before publication; late-payment surcharge accrual and overdue auto-adjustment against the corpus.

Pool account & frequency profiles

Settlement cases and pool-account periods close on schedule; frequency profiles are stored per block so every multiplier is reproducible.

PLATFORM

Eleven tender-grade modules, plus the control-room layer.

01 Admin & Configuration
Block size, mechanism, revision caps; effective-dated band tables; operators, lock/unlock, MFA reset; audit tail, verify, export.

02 Registration
QCA, generating company, utility, consumer, PSS owner, PSS, unit. Multi-step approvals; credentials issued on final approval; QCA ↔ PSS mapping.

03 Scheduling & Forecasting
AvC and schedule intake with revision numbering; curtailment, moderation, day finalisation; wind-physics and solar forecasts with P10/P50/P90; auto-revise.

04 Meter Data
CSV, XLSX and encrypted meter files; main vs check mismatch, recheck, missing blocks; coverage matrix, daily summaries, timeline.

05 Accounting & Billing
Block deviation → slab-progressive charge engine; weekly bill per PSS × QCA; what-if, mechanism compare, bill explanation; dispute filing and finalisation.

06 Finance
Payments with gateway verification and webhooks; corpus accounts, ledgers, utilisation; surcharge accrual; ageing, outstanding by QCA, waterfall.

07 Power & Weather Visibility
Real-time P, Q, status, irradiance, wind, temperature; daily visibility % per unit; degraded / penalty / stoppage states; AvC ↔ visibility mismatch detection.

08 Historian / MIS
Pre-defined reports, top-N deviation leaderboards, ad-hoc query over whitelisted tables, bounded CSV / XLSX / PDF exports.

09 QCA Workspace
Dashboard across all represented PSSs; pooled schedule upload; de-pooled meter upload; stoppage notices on default or de-registration.

10 External Interface
API keys for programmatic access; SLDC dispatch ingest — declared, dispatched, curtailed; notification feed; adapter registry and call logs.

11 Support & Ticketing
Severity SLAs; assignment, escalation, public and internal threads; knowledge base fed by regulator circulars.

+ Control-room layer
Settlement cases, pool-account periods, frequency profiles; approval chains with SLA escalation; auto-generated single-line diagrams; market ticker, monitoring matrix, map, operations wall.

AI co-pilot over live data
34 tools that read the same schedules, meters and bills the operators see — ask why a bill moved, which PSS breached a cap, what a mechanism switch would cost. Answers cite the rows they used. The anomaly agent watches the same tables and files findings, not alerts.

One code base, one database, one audit chain
Every module reads and writes the same schedule, meter and bill records — there is no reconciliation between systems because there is only one system.

BUILT FOR THE SUBSTATION, THE TRADING DESK AND THE AUDITOR

A bill you can defend, line by line, months later.

- **Hash-chained audit trail.** Every write — schedule revision, meter block, rate table, bill line, adjudication — is chained to the one before it. Tail it, verify it, export it.
- **Versioned, never overwritten.** Revisions are numbered and capped; superseded schedules stay readable next to the one that settled.
- **Bill explanation.** From weekly total to day, direction, block and slab — with the band table and frequency multiplier that applied.
- **What-if before publication.** Re-run a week under the other mechanism, a proposed table or a corrected meter file, and see the delta before anyone is billed.
- **Disputes with a paper trail.** Filing, evidence, adjudication and finalisation live in the same record as the bill they contest.
- **Bounded exports.** Reports are sized and whitelisted, so an export is a document, not a database dump.

Security & access

Role-based access for SLDC operators, utilities, QCAs, generators and auditors; multi-factor login; API keys with scopes and call logs; decoy endpoints that alert on probing; hardening reviewed against a published checklist.

Integrations & feeds

Schedules and meters over API, CSV, XLSX and SFTP; OPC-UA and IEC-104 sidecars for telemetry; SLDC dispatch ingest; weather and market feeds; a bridge from AION RE-cast so forecast, schedule and settlement share one identity for every plant.

Observability

Health, queue depth and job timings exported to Prometheus and Grafana; scheduled jobs with SLA escalation; every scraper and adapter call logged with its outcome.

Honest by construction

REDSM does not invent a block. Missing meter data is flagged as missing, not estimated silently; every estimate that is made is labelled as one, and stays labelled on the bill.

WHO IT IS FOR

Configured to your regulation pack, not rebuilt for it.

State load despatch centres
Run the settlement week on one system: intake, promotion, billing, pool account, regulator reports. Switch mechanisms by order date.

DISCOMs & state utilities
See deviation exposure by PSS and QCA before the bill; reconcile meter and schedule without a second system.

QCAs
One workspace across every represented PSS: pooled schedules up, de-pooled meters up, bills and disputes down.

Generators & IPPs
Know which block, which slab and which multiplier moved the bill — and dispute it with the evidence attached.

Regulators & auditors
Verify the chain, replay a week, export a bounded report. No spreadsheets to trust.

Traders & RE desks
Market ticker, deviation leaderboards and top-N views across the fleet, on the same data the bill is cut from.

A 90-DAY PILOT

01 **Weeks 1–2 · Regulation pack.** Load your band tables, mechanism, block size, caps and effective dates. Register PSSs, QCAs and units from your existing lists.

02 **Weeks 3–6 · Shadow settlement.** Ingest live schedules and meter files alongside your current process. Compare bills line by line.

03 **Weeks 7–10 · Operators on the console.** Disputes, approvals, pool account and reports run in REDSM; the spreadsheet chain stays as a check.

04 **Weeks 11–13 · Cut over.** Publish from REDSM. Hand the auditor the chain.

Deployment
Runs on your cloud tenancy or on-premises; one code base, one database; observability and backups included. Data stays in your jurisdiction.

What we need from you
The regulation pack in force, a registry extract, two weeks of schedule and meter files, and one operator who knows how the current bill is built.

What you get
A shadow bill for every week of the pilot, a line-by-line reconciliation against your current process, and a system already configured to go live.

Bring us one settlement week. We will hand it back, explained.

Write to **info@aionpl.com** with the regulation pack you settle under. We will come back with a pilot plan and a configured instance.

AION PRIVATE LIMITED

aionpl.com · info@aionpl.com

REDSM

Renewable Energy Deviation Settlement & Scheduling Platform

ALSO FROM AION

RE-cast · PowerGenie · FloodCast · TerraLens