



Energy



STRAT & IOT

Three Activities, One Value Chain

Strat & IoT operates across **three interdependent activities, Hardware, Software, and Consulting**, forming a single integrated value chain. Unlike pure vendors or advisory firms, the firm accompanies clients from **field device selection** through **platform integration** to **strategic transformation**, with proven references across Europe, West Africa, and India.





STRAT & IOT

Our positioning

In a market where **generalist consultancies** bring business vision but lack **field reality**, and where **IT integrators** deliver technical execution but lack **strategic depth**, Strat & IoT Consulting occupies a unique position, combining **embedded IoT expertise**, **strategic vision**, **field execution**, and a **practitioner network** built through operational missions across **Europe**, **West Africa**, and **India**. With **multi-utility coverage**, **hardware-to-platform fluency**, **large-scale deployment experience**, and **emerging market specialisation**, the firm bridges the gap that no single competitor can close.

Generalist consultancies

- ✓ Business vision
- ✓ Sector benchmarking
- ✗ No IoT expertise
- ✗ Out of touch on the ground

IT Services / IoT Integrators

- ✓ Technical expertise
- ✓ Project delivery
- ✗ No business vision
- ✗ No market intelligence



STRAT & IOT

- ✓ Embedded IoT expertise
- ✓ Strategic vision
- ✓ Ecosystem network
- ✓ Field execution
- ✓ Practitioner, not theorist
- ✓ Multi-utility coverage
- ✓ Multi-geography operational presence
- ✓ Hardware-to-platform fluency
- ✓ Large-scale deployment experience
- ✓ Emerging market specialisation

*The only partner who speaks
technology in the morning and business model in the afternoon.*



STRAT & IOT

Our differentiate know-how

Prepaid Metering, Mobile Money Integration & West African Utility Operations

West Africa's STS prepaid model is structurally sound but operationally limited: consumers depend on physical vending points, paper tokens, and manual keypad entry. The **QR code mobile money model**, integrating Orange Money, Moov Money, and Wave directly with the STS token engine and AMI head-end, eliminates the physical vending chain entirely, enabling instant recharge from any smartphone, reducing transaction cost by 60 - 80%, and accelerating revenue settlement to near real-time.

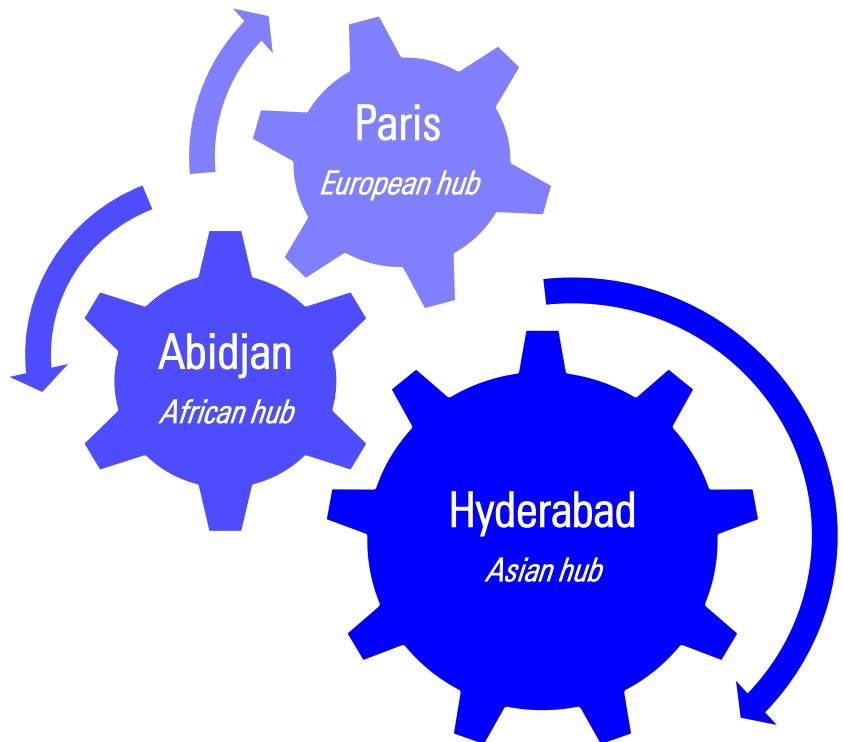
For the growing **prosumer segment**, rooftop solar customers injecting surplus into the electricity grid, the QR code interface becomes bidirectional: displaying net metering balances, generation data, and enabling feed-in credit transfer to mobile money wallets without staff intervention.

Combined with **automated outage notification** (SMS/WhatsApp from AMI head-end events) and **digital helpdesk integration** (full account history accessible via QR code scan), this model directly addresses the three drivers of low customer satisfaction (disconnection without notice, opaque billing, and inaccessible complaint resolution) with measurable impact on ANARE-CI and CRSE customer quality indicators.

Strategy, Regulatory Intelligence & European Smart Grid Expertise

Europe leads globally in smart metering penetration: France exceeds 95% (Enedis Linky, 40 million meters), Spain 100% (Iberdrola, Union Fenosa), Italy (ENEL) completed its 2G programme, and Belgium (ORES, Fluvius) finalised rollout between 2020 and 2024. The current focus has shifted from deployment to exploitation: DER integration, flexibility markets, prosumer management, and DERMS deployment under EU Energy Efficiency Directive and Electricity Market Regulation.

Strat & IoT's Paris headquarters provides three competitive advantages: **technical credibility** built directly on the programmes that defined European best practice; **regulatory intelligence** through proximity to Expert Group frameworks; and **institutional access** to the Franco-Indian and Franco-African ecosystems that underpin the firm's three-hub commercial model.



Multi-Technology IoT Architecture, AMI Deployment at Scale & Industrial Advisory

India's overhead aerial wire network, characterised by high harmonic distortion (THD regularly above 15 - 20%), aerial conductor attenuation, and complex feeder topology, makes **PLC G3-OFDM unreliable** in most RDSS deployment contexts. Where European underground cable networks propagate PLC signals effectively, Indian LV networks require **RF Mesh** (sub-GHz, self-healing, immune to electrical noise), **LoRaWAN** (for dispersed or rural topologies), or **NB-IoT/4G** (cellular fallback). A multi-technology architecture that must be selected per site through rigorous survey and pilot validation.

Strat & IoT brings differentiated expertise from **street lighting and urban IoT deployments** (RF Mesh, LoRaWAN, NB-IoT), directly applicable to RDSS AMI architecture design. On deployment risk, the firm's large-scale rollout experience provides structured methodology for **wave planning** to build RF Mesh coverage progressively, **installer certification at scale**, and **spectrum coordination** between parallel AMISPs: the three most frequent causes of RDSS programme cost overrun.



STRAT & IOT

Why our earth in the energy ?



Industrial & DISCOM convergence: shared infrastructure, competing priorities, regulatory complexity



Energy transition accelerating DER, prosumer & microgrid penetration across all three utilities



Industries demand 24/7 supply quality; DISCOMs face AT&C losses, ageing assets & financing gaps

KEY RISKS

Non-Revenue Water: Physical leaks & commercial losses (unbilled, illegal connections) eroding utility revenue

Infrastructure ageing: Cast-iron & asbestos cement mains with high burst frequency

Energy cost exposure: Pumping energy = 30 - 40% of water utility OPEX with unoptimized pump scheduling driving unnecessary costs

Contamination risk: Pressure drops enabling backflow contamination with undetected without real-time pressure monitoring at DMA level

OPERATIONAL CHALLENGES

- **District Metered Area (DMA)** zoning & **minimum night flow** analysis
- Smart meter **integration** (Woltman, ultrasonic, EMF)
- **Pressure transient** detection & **burst pre-indication** analytics
- **Hydraulic model calibration** for **loss localisation** accuracy

KEY RISKS

Safety & leakage: Gas leaks are life-safety events with undetected distribution losses create explosion risk, regulatory liability & reputational exposure

Measurement accuracy: Flow measurement drift at industrial offtake points with revenue loss and commercial disputes between utility and large consumers

Hydrogen compatibility: Existing gas meters, seals & communication infrastructure not validated for hydrogen blending with fleet replacement risk

SCADA vulnerability: Remote pressure regulation & valve control via SCADA with single point of failure for entire distribution zone if compromised

KEY RISKS

Grid instability: DER reverse power flows causing voltage excursions & harmonic pollution on feeders serving industrial loads

Revenue leakage: AT&C losses 15 - 30% in emerging markets with meter tampering, illegal connections, billing inaccuracy

Asset failure: Overloaded distribution transformers with accelerated ageing from EV charging clusters & industrial load surges

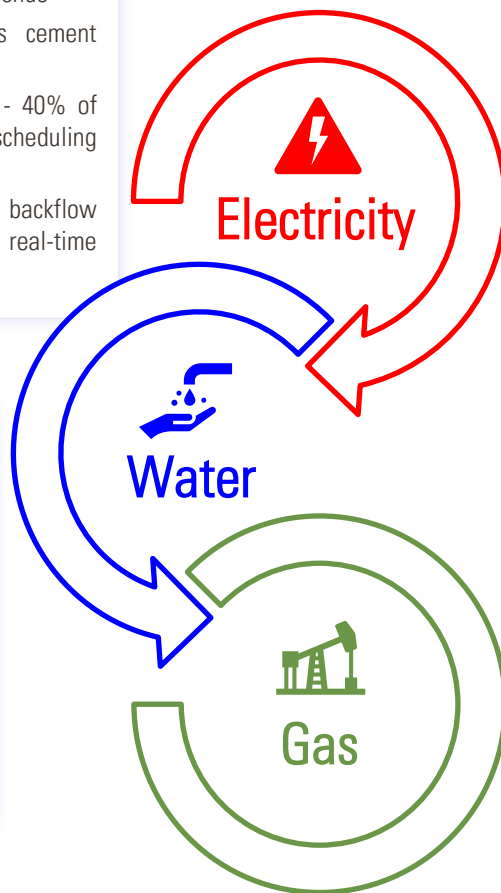
Cybersecurity: SCADA & AMI head-end exposure with ransomware & OT intrusion risk on converged IT/OT infrastructure

OPERATIONAL CHALLENGES

- **DERMS** deployment readiness vs legacy **SCADA/DMS** infrastructure
- **Feeder-level energy balance:** unmetered agricultural load (India)
- Industrial **prosumer injection contract** governance & grid impact
- **Real-time voltage profile** management across **11kV feeder** with DER

OPERATIONAL CHALLENGES

- **IoT gas meter** connectivity in enclosed environments
- **Calorific value normalisation** across multi-source gas supply chains
- **STS prepaid** gas metering rollout: token engine & CIU integration
- **Hydrogen blending** detection & meter validation protocols

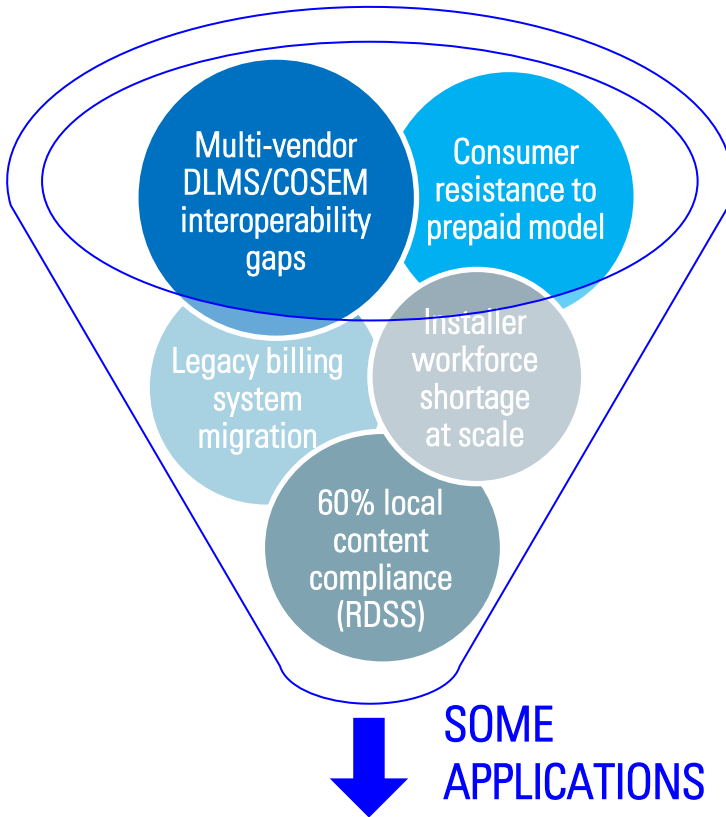




Prepaid & smart metering

From Hardware to Operational Model

CHALLENGES



- ☐ End-to-end AMI programme management
- ☐ DLMS/COSEM architecture design & head-end interoperability governance
- ☐ Wave deployment planning, installer training & field support governance
- ☐ Phased rollout strategy: govt offices → C&I → residential prioritisation
- ☐ AMISP contract structuring & SLA governance frameworks

ADDED VALUE OF STRAT & IOT



SOME APPLICATIONS



Technical Layer

Meter Hardware

- ✓ BIS/DLMS/COSEM-compliant
- ✓ PLC G3, RF Mesh, NB-IoT communication
- ✓ STS prepaid token engine & CIU interface
- ✓ Bidirectional metering for prosumers

AMI Architecture

- ✓ Head-end system (HES) & MDMS integration
- ✓ DCU placement & backhaul strategy
- ✓ End-to-end encryption & key management
- ✓ OTA firmware update management

Data Model

- ✓ DLMS/COSEM object configuration
- ✓ Scan rates, compression & retention policies
- ✓ Energy balance: feeder → DT → consumer
- ✓ Power quality event historization



Strategic Layer

Programme Design

- ✓ Technology selection: PLC vs RF vs cellular
- ✓ Vendor qualification & TCO analysis
- ✓ Pilot zone definition & KPI framework
- ✓ Regulatory alignment (tariff, net metering)

Business Case

- ✓ AT&C loss reduction: 5–15% improvement
- ✓ Meter reading cost elimination
- ✓ Revenue recovery from accurate billing
- ✓ Subsidy & grant funding optimisation

Roadmap

- ✓ Phased rollout: C&I → govt → residential
- ✓ AMISP / TOTEX PPP model structuring
- ✓ Legacy system migration strategy
- ✓ Long-term platform evolution planning



Operational Layer

Field Deployment

- ✓ Wave planning & connection priority sequencing
- ✓ Installer training & certification programme
- ✓ FAT/SAT governance & acceptance protocols
- ✓ Access management: hard-to-reach sites

Customer Operations

- ✓ Mobile recharge integration (UPI, QR code)
- ✓ Low-balance alerts & prepaid reconciliation
- ✓ Multilingual helpdesk & complaint management
- ✓ Outage notification workflows

Performance

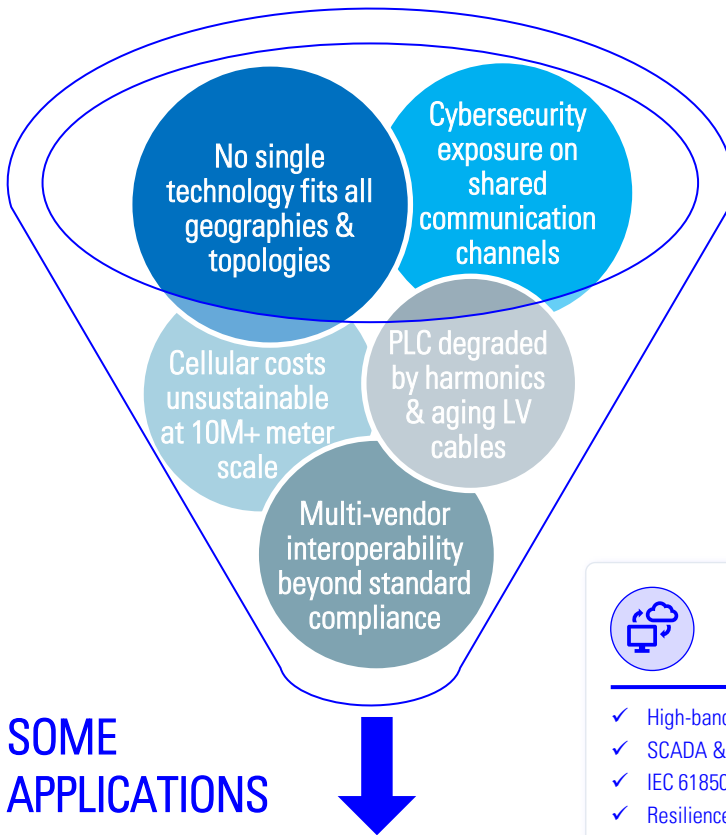
- ✓ First-visit success rate monitoring
- ✓ Head-end registration & data quality KPIs
- ✓ SLA governance & penalty framework
- ✓ Monthly DISCOM performance dashboard



Communication protocols

Overcoming Connectivity Constraints

CHALLENGES



SOME APPLICATIONS

- ❑ PLC G3 & DLMS/COSEM stack expertise from large-scale AMI deployments
- ❑ Multi-technology architecture design: PLC + RF + cellular fallback strategy
- ❑ DCU placement methodology validated through European & African deployments
- ❑ Protocol interoperability gap assessment & HES integration advisory
- ❑ Communication performance KPI governance & SLA framework design



Fibre / Ethernet

- ✓ High-bandwidth backhaul for substations
- ✓ SCADA & RTU communication backbone
- ✓ IEC 61850 GOOSE messaging at substation
- ✓ Resilience combined with cellular last-mile
- ✓ Foundation for smart substation architecture



ADDED VALUE OF STRAT & IOT



Connectivity Performance governance

- ✓ Daily meter communication rate KPI: >95%
- ✓ DCU-to-HES backhaul availability monitoring
- ✓ Protocol fault diagnostic & root cause analysis
- ✓ OTA firmware update success rate tracking
- ✓ Encrypted channels & auth key rotation



PLC G3-OFDM

- ✓ Power line communication over existing LV network
- ✓ No additional field infrastructure required
- ✓ Ideal for dense urban environments
- ✓ Sensitive to harmonics & network quality
- ✓ Standard: IEEE 1901.2 / G3-PLC Alliance



Multi-Technology Architecture

- ✓ Site survey & topology analysis before selection
- ✓ PLC primary + RF/cellular fallback resilience
- ✓ DCU placement validated through pilot testing
- ✓ Avoid single-technology lock-in for large programmes



NB-IoT / 4G LTE

- ✓ Cellular communication & operator infrastructure
- ✓ High coverage for dispersed/rural topologies
- ✓ Recurring SIM & connectivity costs
- ✓ Low power for battery-operated field devices
- ✓ Ideal for DT sensors & remote assets



Protocol & Interoperability

- ✓ DLMS/COSEM (IEC 62056): application layer
- ✓ IEC 61968/61970 CIM: grid data model
- ✓ MQTT & REST API for IoT platform connectivity
- ✓ IEC 61850: substation & protection communication
- ✓ DNP3 / Modbus: legacy SCADA integration



RF Mesh

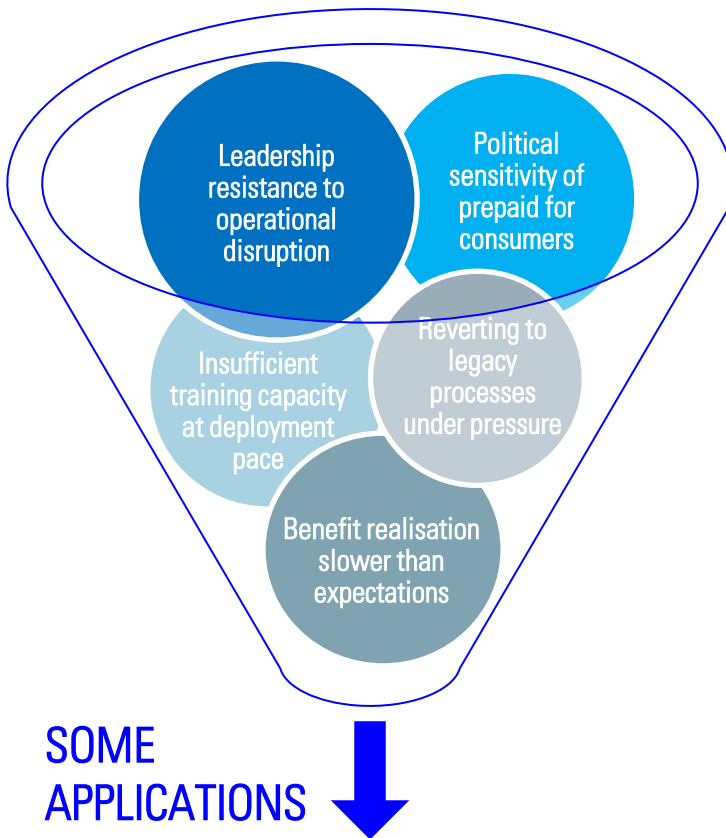
- ✓ Radio frequency mesh & self-healing network
- ✓ Higher reliability in degraded LV networks
- ✓ Requires RF infrastructure investment
- ✓ Best fit: high harmonic distortion areas
- ✓ Frequency bands: 868/915 MHz, 2.4 GHz



Change management

Human Dimension of Digital Transformation

CHALLENGES



SOME APPLICATIONS

- ☐ Country Manager training programme design & delivery (India, West Africa)
- ☐ Installer certification frameworks for large-scale AMI rollouts
- ☐ Consumer engagement strategies: multilingual, community-level adoption campaigns
- ☐ PMO governance & benefit realisation tracking for digital transformation programmes
- ☐ Organisational redesign advisory: staff redeployment from field to analytics roles

ADDED VALUE OF STRAT & IOT



Leadership & Organisation

Executive Alignment

- ✓ Strategic rationale to senior management
- ✓ Change sponsorship & visible leadership
- ✓ Organisational readiness assessment
- ✓ Decision governance for transformation

Role Redesign

- ✓ New competency frameworks for digital roles
- ✓ Staff redeployment to higher-value tasks
- ✓ Performance KPI realignment
- ✓ Cross-functional team structuring

Culture Shift

- ✓ From reactive to predictive mindset
- ✓ Data-driven decision culture
- ✓ Innovation & continuous improvement
- ✓ Knowledge management & lessons learned



Training & Capability

Technical Training

- ✓ Smart meter hardware & commissioning
- ✓ SCADA/ADMS/DMS platform operation
- ✓ DLMS/COSEM & communication stack
- ✓ Cybersecurity awareness & OT/IT practices

Process Training

- ✓ New billing & prepaid reconciliation workflows
- ✓ Outage management & FDIR procedures
- ✓ Asset management & maintenance protocols
- ✓ Regulatory reporting & compliance

Consumer Engagement

- ✓ Multilingual communication campaigns
- ✓ Community-level meter demonstrations
- ✓ Helpdesk agent training
- ✓ Transparent dispute resolution frameworks



Programme Governance

Change Roadmap

- ✓ Sequenced stakeholder engagement plan
- ✓ Quick wins identification & early delivery
- ✓ Resistance mapping & mitigation
- ✓ Communication calendar & channels

Impact Assessment

- ✓ Role impact analysis per department
- ✓ Process gap: as-is vs to-be mapping
- ✓ Workload transition planning & timing
- ✓ Benefit realisation tracking vs baseline

Sustainability

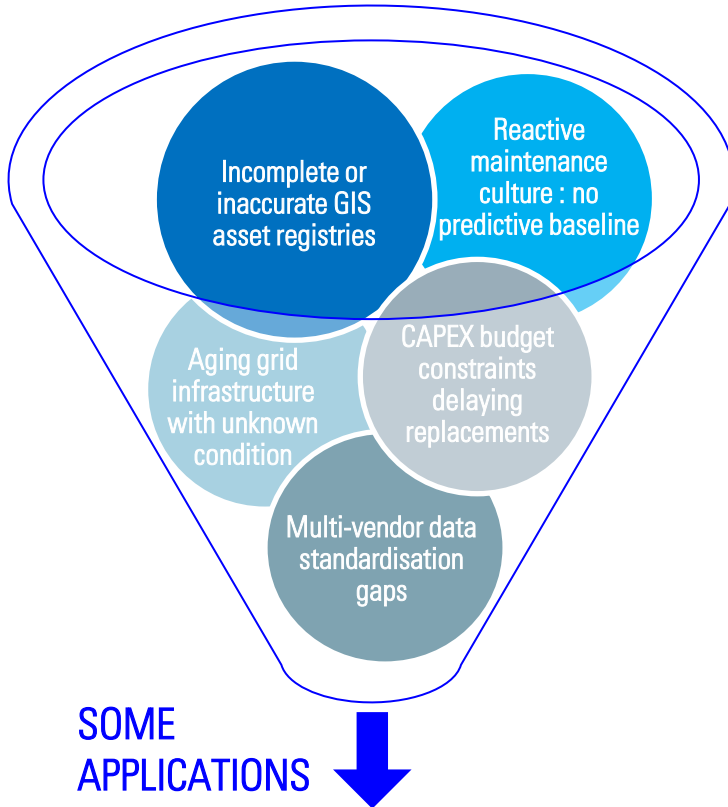
- ✓ Internal change champion network
- ✓ Post-implementation hypercare support
- ✓ Continuous improvement feedback loops
- ✓ Long-term capability embedding metrics



Asset management

Lifecycle Governance for Grid Infrastructure

CHALLENGES



SOME
APPLICATIONS

- ❑ Standardised FAT/SAT & commissioning frameworks across European & African deployments
- ❑ Asset lifecycle management advisory for connected infrastructure
- ❑ GIS-linked asset registry design & ADMS topology integration methodology
- ❑ SLA governance design: preventive, corrective & predictive maintenance frameworks
- ❑ CAPEX justification & RAB methodology advisory for DSO regulatory submissions

ADDED VALUE
OF STRAT & IOT



GIS & Asset Registry

- Single source of truth for all field assets
- Geospatial network topology mapping
- Asset attribute management & history
- Integration with ADMS/SCADA topology engine
- Mobile GIS for field crew real-time updates



Predictive Analytics

- AI/ML-based failure prediction models
- Load profile anomaly detection per DT
- Voltage sag/swell clustering by feeder zone
- Communication failure rate trending
- Transformer thermal degradation modelling



Financial & Regulatory

- Regulatory asset base (RAB) methodology
- CAPEX programme investment justification
- Maintenance cost benchmarking vs peers
- SLA penalty & incentive tracking
- SAIDI/SAIFI regulatory reporting

Specification & Procurement

- ✓ Technical spec & vendor qualification
- ✓ FAT design & witness management
- ✓ TCO: CAPEX + OPEX + warranty
- ✓ BIS/IEC certification compliance

Installation & Commissioning

- ✓ Site survey & pre-installation audit
- ✓ Loop-check & acceptance protocols
- ✓ GIS asset registration & as-built docs
- ✓ FAT/SAT completion governance

In-Service Monitoring

- ✓ Remote condition monitoring
- ✓ Load profile & power quality analytics
- ✓ DT temperature & loading dashboards
- ✓ SAIDI/SAIFI tracking per asset

Maintenance Operations

- ✓ Preventive: scheduled inspection cycles
- ✓ Predictive: anomaly detection & AI alerts
- ✓ Corrective: fault - dispatch - repair
- ✓ OTA firmware & config updates

End-of-Life & Replacement

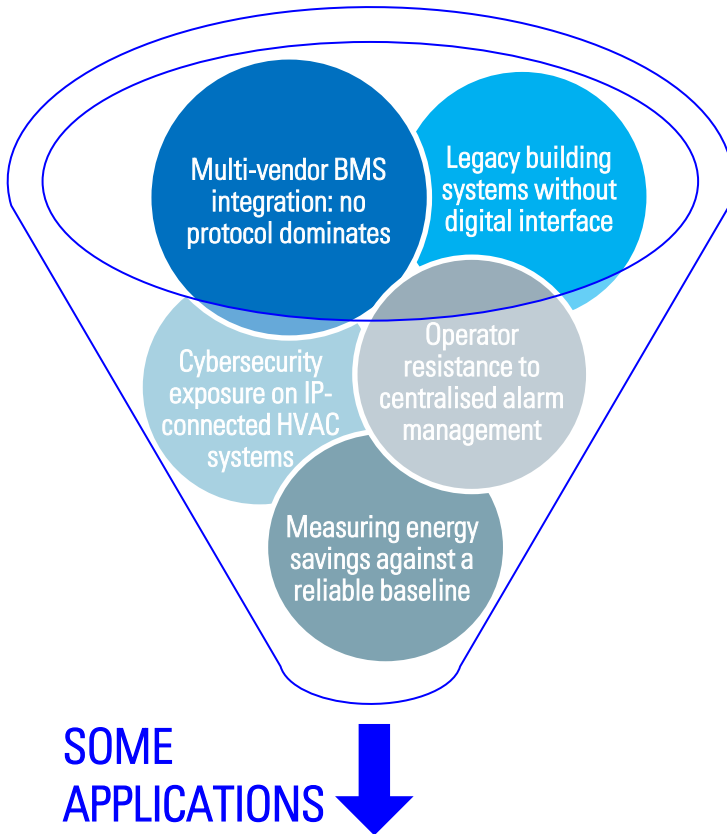
- ✓ Asset health index & risk scoring
- ✓ Age-based replacement planning
- ✓ CAPEX forecasting & modelling
- ✓ Circular economy & asset disposal



Building Management System

Intelligent Infrastructure Control

CHALLENGES



- ☐ AVEVA System Platform deployments across campuses
- ☐ Multi-vendor BMS integration: BACnet, Modbus, LONWorks, OPC protocols
- ☐ FAT/SAT commissioning governance & operator training programmes
- ☐ Energy performance benchmarking & sub-metering analytics framework design
- ☐ BMS-to-ADMS interface advisory: demand response integration & prosumer grid management

ADDED VALUE OF STRAT & IOT



Technical Layer

Core BMS Functions

- ✓ HVAC supervision & energy optimisation
- ✓ Electrical distribution monitoring (LV/MV)
- ✓ Lighting control & presence detection
- ✓ Fire & life safety system integration
- ✓ Access control & CCTV integration

Communication Protocols

- ✓ BACnet (ASHRAE 135): primary standard
- ✓ LonWorks, Modbus, KNX, OPC-UA
- ✓ MQTT for IoT sensor connectivity
- ✓ API gateway for cloud platform integration

Platform Architecture

- ✓ AVEVA / Ignition / Siemens Desigo CC
- ✓ Multi-site Galaxy architecture for campuses
- ✓ ArchestrA object templates & standardisation
- ✓ OT historian: real-time + long-term retention



Strategic Layer

Energy Performance

- ✓ ISO 50001 energy management framework
- ✓ Energy performance contract (EPC) structuring
- ✓ LEED / BREEAM certification support
- ✓ Carbon footprint monitoring & ESG reporting

Asset Integration

- ✓ Digital twin of building systems
- ✓ Predictive maintenance for HVAC & chillers
- ✓ Equipment lifecycle cost optimisation
- ✓ Spare parts & SLA maintenance governance

Regulatory & Grid Interface

- ✓ Demand response as flexible grid asset
- ✓ Peak demand management & tariff optimisation
- ✓ Net zero building roadmap planning
- ✓ Smart grid: prosumer & V2G readiness



Operational Layer

Supervision & Control

- ✓ 24/7 centralised control room operations
- ✓ Alarm management & escalation protocols
- ✓ Remote diagnostics & fault resolution
- ✓ Mobile operator interface for field teams

Energy Analytics

- ✓ KPI dashboards: COP, PUE, EUI, load factor
- ✓ Sub-metering per floor / zone / equipment
- ✓ Anomaly detection: consumption vs schedule
- ✓ Benchmarking vs industry standards

Commissioning & Handover

- ✓ FAT/SAT protocols for BMS deployments
- ✓ Operator training & certification programme
- ✓ O&M manual & as-built documentation
- ✓ Defect liability period governance



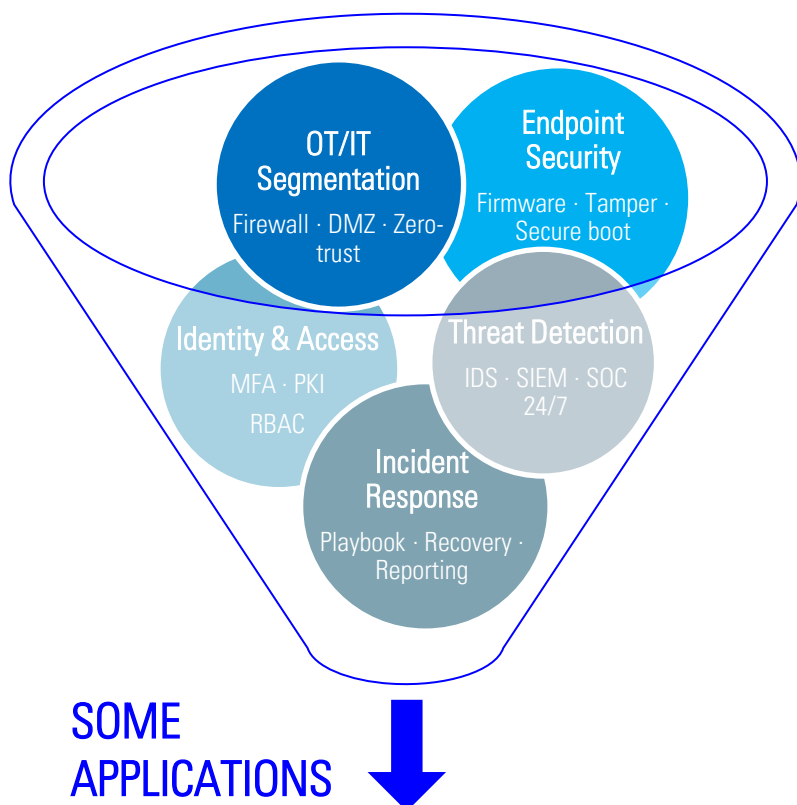
Core enablers Cybersecurity

STRAT & IOT

APPLICATIONS

INNOVATION, CYBER & AI

CHALLENGES



- ❑ OT/IT convergence security advisory: SCADA, AMI head-end & field device hardening
- ❑ DLMS/COSEM authentication & PLC G3 encryption expertise from AMI product development
- ❑ CERT-In & IEC 62443 compliance roadmaps for DISCOMs, water utilities & gas DSOs
- ❑ AI-augmented threat detection frameworks: OT behavioural analytics & SIEM integration design
- ❑ SIS segregation & functional safety advisory for gas networks (IEC 61511 alignment)

ADDED VALUE OF STRAT & IOT



SOME APPLICATIONS

ELECTRICITY

Threat Landscape

- SCADA / ADMS intrusion
- AMI head-end attack
- Smart meter tampering
- Ransomware on billing & MDMS

Defence Architecture

- OT/IT network segmentation
- AMI head-end hardening
- Smart meter secure boot & firmware signing
- SCADA IDS

AI-Augmented Security

- ML-based AMI traffic analysis
- Behavioural baseline modelling
- AI-driven false positive reduction
- Predictive vulnerability scoring

WATER

Threat Landscape

- SCADA pump & valve manipulation
- Water quality system tampering
- DMA sensor spoofing
- Billing & CRM system ransomware

Defence Architecture

- Air-gapped or strictly segmented OT network
- Remote telemetry unit (RTU) authentication
- Chemical dosing controller access control
- Multi-factor access for SCADA HMI

AI-Augmented Security

- Sensor data integrity validation
- Anomalous operator command detection
- DMA tamper-event correlation
- AI-assisted incident triage

GAS

Safety, Leakage & Integrity

- Remote valve control compromise
- Gas chromatograph data manipulation
- Cathodic protection system attack
- CGD head-end compromise

Flow Measurement & Billing Accuracy

- Safety Instrumented System (SIS) segregation
- Gas chromatograph data integrity
- Remote telemetry encryption for regulation
- Prepaid CGD head-end hardening

AI-Augmented Security

- SCADA pressure & flow anomaly ML
- Gas chromatograph integrity monitoring
- Insider threat detection for pipeline SCADA
- Automated IEC 62443 compliance assessment



Core enablers

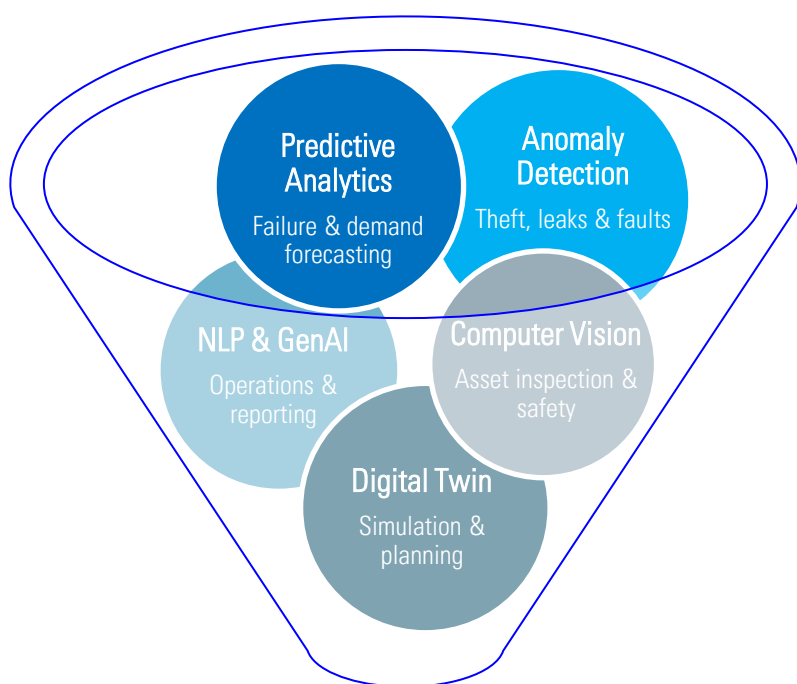
AI Applications

STRAT & IOT

APPLICATIONS

INNOVATION, CYBER & AI

CHALLENGES



- ❑ AI-driven AT&C loss diagnostic & theft detection frameworks for DISCOMs
- ❑ Predictive maintenance model design for AMI fleets, DT assets & water network infrastructure
- ❑ DERMS AI dispatch advisory: BESS optimisation, VPP aggregation & demand-response ML frameworks
- ❑ NRW AI analytics: DMA anomaly detection, pressure transient ML & hydraulic model calibration
- ❑ GenAI for automated regulatory reporting, SLA dashboards & field support (multilingual)

SOME APPLICATIONS



ADDED VALUE OF STRAT & IOT



ELECTRICITY



Predictive Maintenance & Asset Health

- Transformer failure probability scoring
- Cable degradation prediction
- Switchgear contact wear detection
- Smart meter fleet health



Grid Operations & Loss Reduction

- AT&C loss disaggregation
- Theft & tamper detection
- Demand forecasting
- Volt/VAR optimisation



DER & Flexibility Intelligence

- DERMS dispatch optimisation
- Rooftop solar generation forecasting
- EV charging load prediction
- Virtual power plant (VPP) aggregation



WATER



Leak Detection & NRW Reduction

- Minimum night flow (MNF) anomaly detection
- Pressure transient analysis
- Acoustic leak correlation
- Asset-based NRW disaggregation



Network Optimisation & Quality

- Pump scheduling optimisation
- Hydraulic model auto-calibration
- Water quality prediction
- Pressure zone management



Demand & Infrastructure Planning

- Consumption forecasting per DMA
- Pipe burst risk scoring
- Rehabilitation prioritisation
- Industrial customer demand profiling



GAS



Safety, Leakage & Integrity

- Gas leak detection
- Pipeline integrity scoring
- Pressure anomaly detection
- Incident precursor identification



Flow Measurement & Billing Accuracy

- Meter drift detection
- Unaccounted-for gas (UFG) disaggregation
- Industrial load forecasting
- Calorific value normalisation

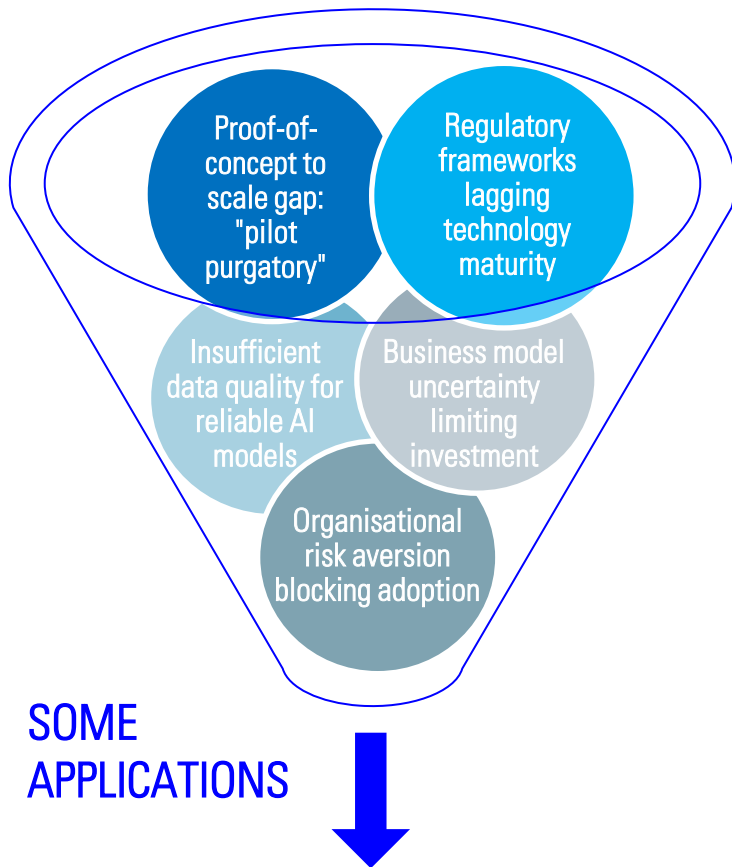


Decarbonisation & Future Networks

- Hydrogen blending optimisation
- Biogas injection monitoring
- Demand flexibility for gas-to-power
- Carbon accounting



CHALLENGES



- ❑ BESS, microgrid & DER deployment advisory across West Africa and India
- ❑ DERMS deployment readiness diagnostic & phased adoption roadmap
- ❑ IoT roadmap development: smart building, flexibility & energy metering service lines
- ❑ Benchmark & strategic service line development: 10% market share growth in one year
- ❑ Regulatory sandbox advisory

ADDED VALUE OF STRAT & IOT



Digital Twin & Simulation

- ✓ Real-time network digital twin for planning
- ✓ Fault scenario simulation before deployment
- ✓ DER hosting capacity modelling
- ✓ Investment under multiple demand scenarios
- ✓ Grid resilience stress-testing



AI & Machine Learning

- ✓ Predictive maintenance: failure probability
- ✓ AT&C loss root cause disaggregation
- ✓ Demand forecasting at feeder & substation
- ✓ Anomaly detection: theft, tamper, billing gaps
- ✓ Natural language interfaces for field support



Green Energy Technologies

- ✓ Rooftop solar & community microgrid integration
- ✓ BESS sizing & dispatch optimisation
- ✓ Green hydrogen as long-duration storage
- ✓ Carbon accounting & emissions tracking
- ✓ EV smart charging & V2G grid services



IoT & Edge Computing

- ✓ Edge analytics at DCU & RTU level
- ✓ LPWAN sensors for asset monitoring
- ✓ Distributed intelligence for FDIR
- ✓ 5G private network for industrial IoT
- ✓ Digital substation: IEC 61850 process bus



Emerging Business Models

- ✓ Virtual power plant (VPP) aggregation
- ✓ Peer-to-peer energy trading marketplace
- ✓ Energy-as-a-Service (EaaS) subscription
- ✓ Flexibility marketplace integration
- ✓ Carbon credit from loss reduction



Open Innovation & Ecosystem

- ✓ Start-up scouting & technology incubation
- ✓ Academic & research partnerships
- ✓ Open API for third-party developers
- ✓ Cross-sector data sharing (mobility, BMS)
- ✓ Regulatory sandbox participation



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& IOT**

