TESCO METERING

# AMI 2.0 on Private LTE

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# Private LTE

# PLTE Core Value Proposition – 3 Pillars

THREE ADVANTAGES. ONE PLATFORM.

1

## CONVERGE APPLICATIONS

**One network for every use case**

AMI + distribution automation
Voice, video + mobile workforce
High bandwidth + ultra-low latency

SIMPLER INFRASTRUCTURE

2

## SCALE WITH CONFIDENCE

**Utility control at any scale**

Carrier-grade reliability
Coverage, security + power backup
Sensors through grid-control devices

RESILIENT AT SCALE

3

## PRESERVE CHOICE

**Standards-based flexibility**

Global 3GPP standard
Multi-vendor hardware + devices
Lower cost + less vendor lock-in

LONG-TERM FLEXIBILITY

ONE PRIVATE LTE PLATFORM

**Converge applications. Scale securely. Preserve choice.**

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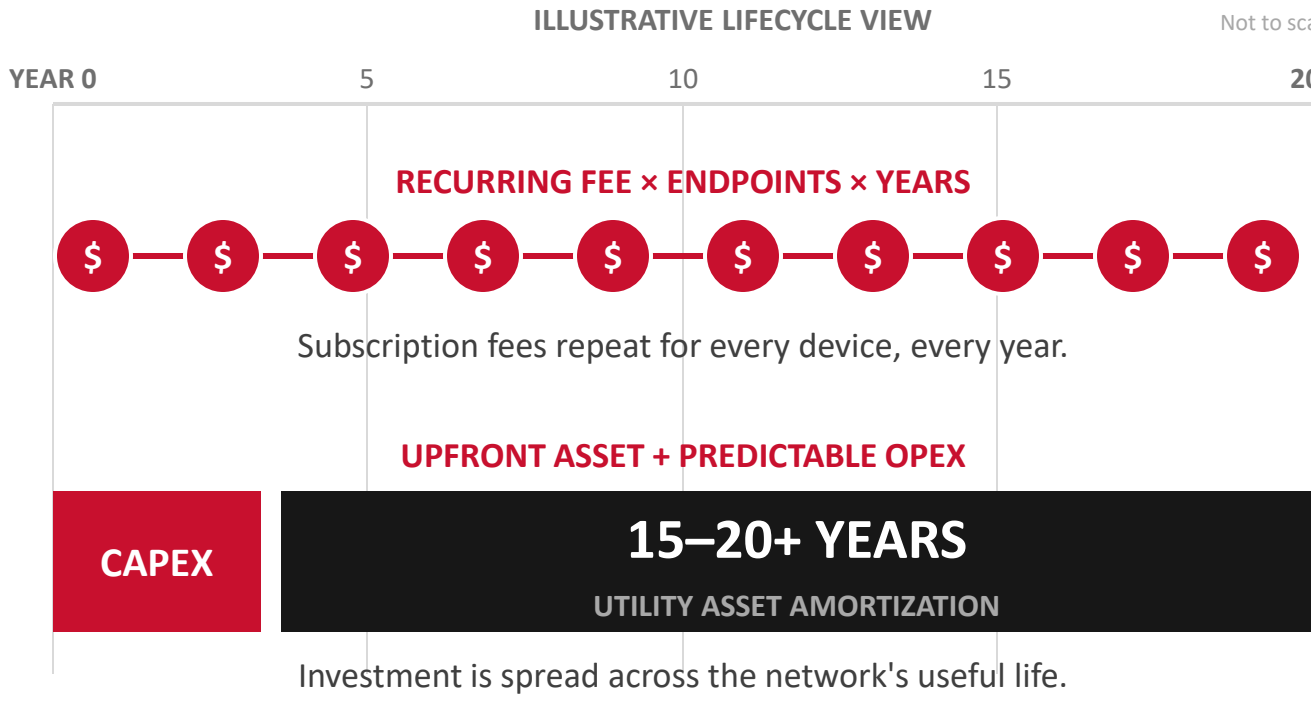
# Private LTE Changes The Cost Model

Replace recurring subscriptions with a utility asset amortized over 15–20+ years.




LIFECYCLE RESULT

**LOWER TCO**

- Predictable OPEX
- Utility control

THE BUSINESS CASE

**Own the asset instead of renting the network.**

# Network Reliability & Disaster Resilience

Hardened power, redundant backhaul and dedicated capacity protect field communications.

PUBLIC NETWORK UNDER STRESS

## DISRUPTION COMPOUNDS

01 CONGESTION

02 POWER LOSS

03 DISASTER DAMAGE

Extreme weather can trigger all three.

PRIVATE LTE HARDENING

UTILITY-GRADE CONNECTIVITY

1 **HARDENED POWER**
Extended battery and generator backup at cell sites — STAY UP

2 **REDUNDANT BACKHAUL**
Bidirectional fiber and microwave paths maintain routes — ROUTE AROUND

3 **DEDICATED CAPACITY**
Field traffic remains available during public-network congestion or failure — STAY CONNECTED

**FIELD CONNECTIVITY WHEN PUBLIC NETWORKS FAIL**

PROOF IN PRACTICE

## SOUTHERN LINC

**Alabama Power • Georgia Power • Mississippi Power**

**Generators • Fuel cells • Bidirectional fiber • Microwave backhaul**

# Private LTE Puts Critical Traffic First

Utility-controlled scheduling and network slicing prioritize SCADA and DTT commands.

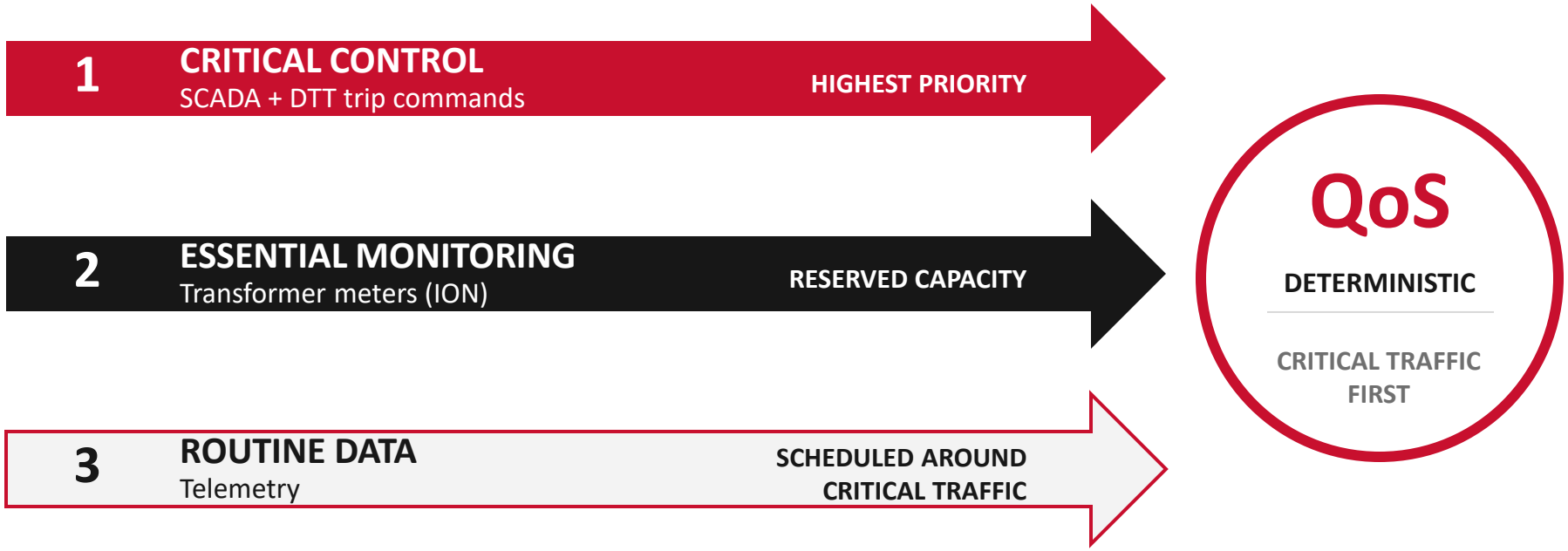
UTILITY QoS CONTROL

**SCHEDULE**
**SLICE**
**PRIORITIZE**

The utility defines how traffic moves.

UTILITY-DEFINED NETWORK SLICES

ENFORCED PRIORITY

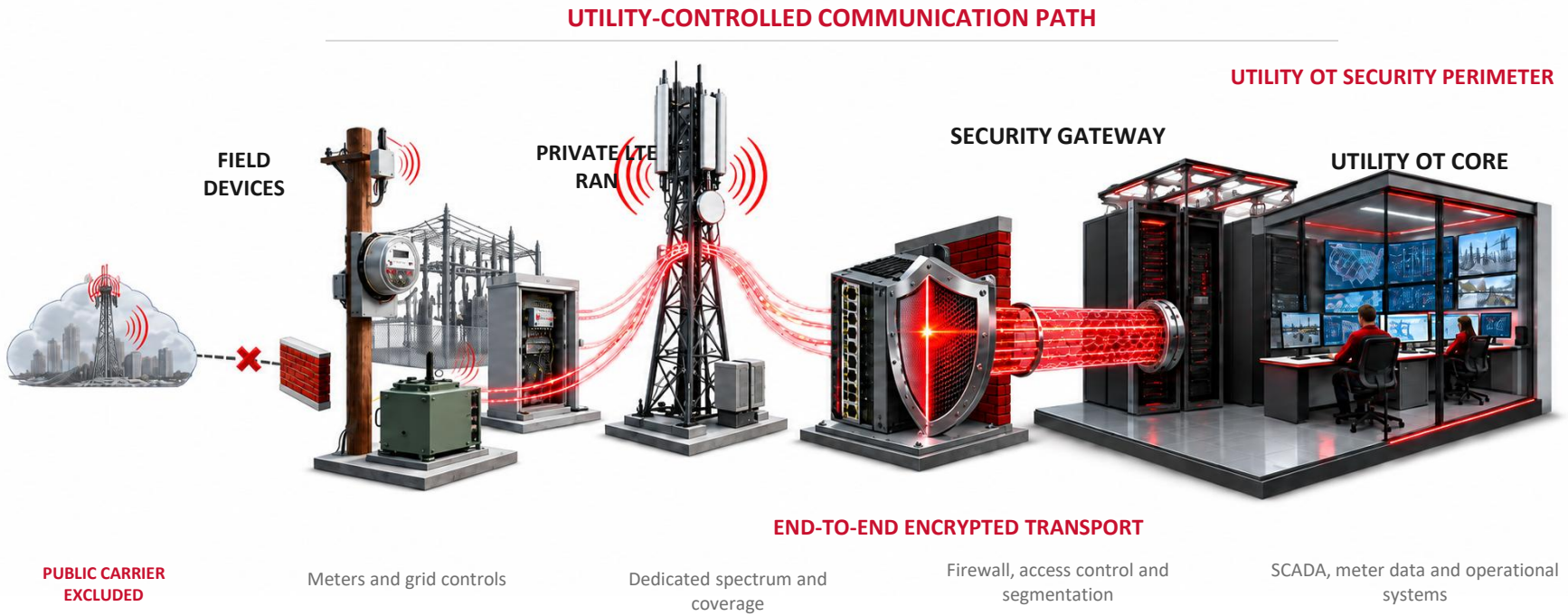



OPERATIONAL RESULT

**Critical commands move first. Routine data waits.**

# Private LTE Keeps Utility Data Under Control

Private spectrum, corporate firewalls and end-to-end encryption reduce outside exposure.




## CONTROL OUTCOMES

**01 DATA CONTROL**

Communications remain utility-controlled

**02 LOWER EXPOSURE**

Removes third-party commercial transport

**03 NERC CIP ALIGNMENT**

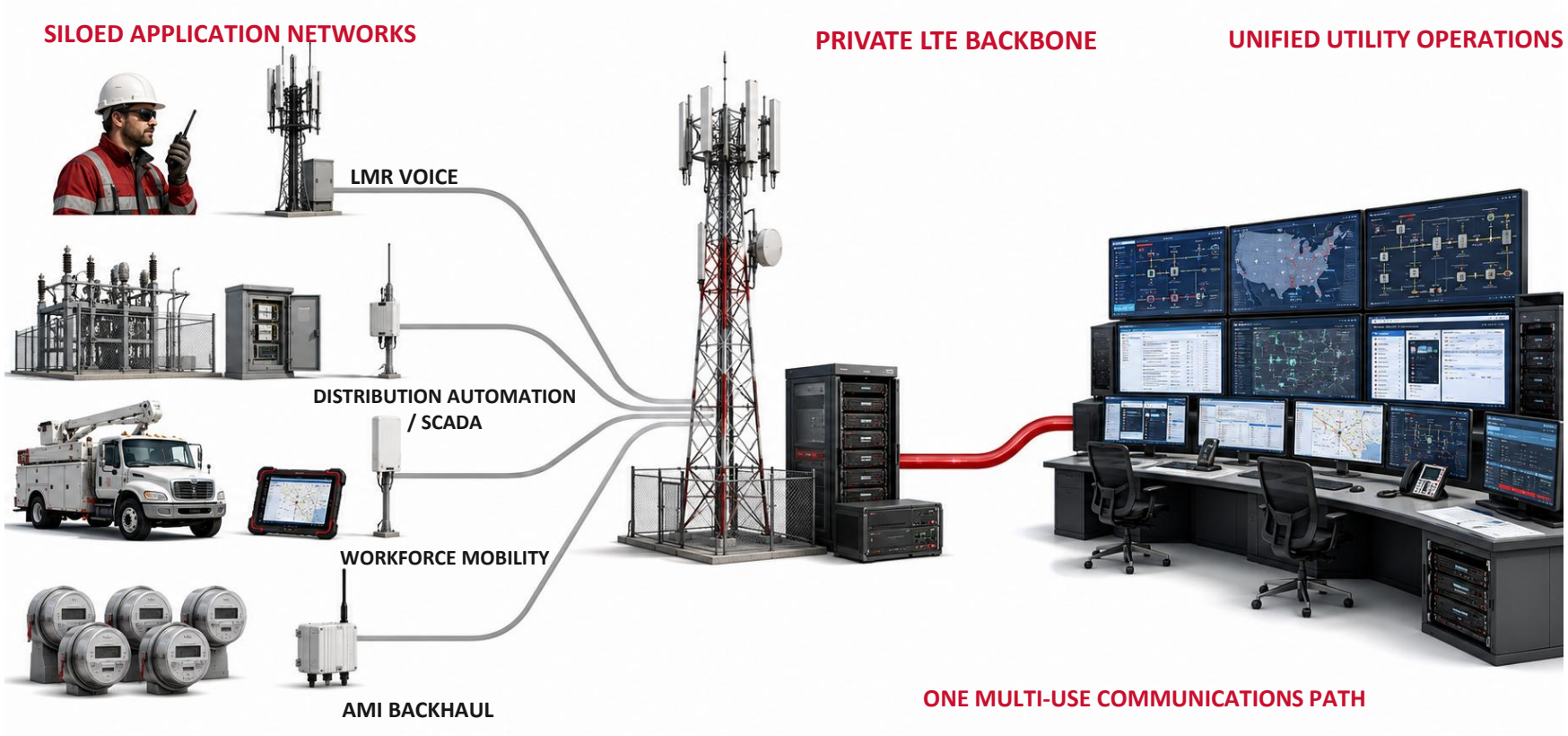
Simplifies security governance and compliance

SECURITY OUTCOME

**Keep communications closed, encrypted and utility-controlled.**

# Private LTE Consolidates Siloed Networks

Voice, grid automation, workforce mobility and AMI converge on one utility-owned backbone.




**REAL-WORLD NETWORK SPRAWL**

**17**

**SEPARATE WIRELESS NETWORKS**

Ameren supported varied SCADA applications across a fragmented wireless environment.

**12-18** disparate networks at many utilities

**CONSOLIDATION OUTCOME**

**Consolidate 12-18 siloed networks into one utility-owned backbone.**

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# Ubiquitous & Targeted Coverage

Utility-owned RAN design follows substations, feeders and remote assets—not population density.

## TWO DIFFERENT COVERAGE PRIORITIES

COMMERCIAL CELLULAR

### Coverage follows people

Networks optimize for population density and consumer traffic—not the location of critical grid infrastructure.

**Remote substations, feeders and edge meters can remain outside the footprint.**

PRIVATE LTE

### Coverage follows the grid

The RAN is engineered around substations, feeders, remote assets and the utility's operating geography.

**Coverage reaches meters and devices commercial networks may miss.**

01 **REACH THE EDGE**

Extend the RAN to previously unreachable meters.

02 **USE UTILITY SITES**

Substation monopoles can reduce deployment cost.

COVERAGE OUTCOME

**Target critical grid assets—not population centers.**

# How AMI 2.0 Benefits from Private LTE

Real-time sensing demands more bandwidth and lower latency than meter-to-cash collection.

THE SHIFT

PASSIVE

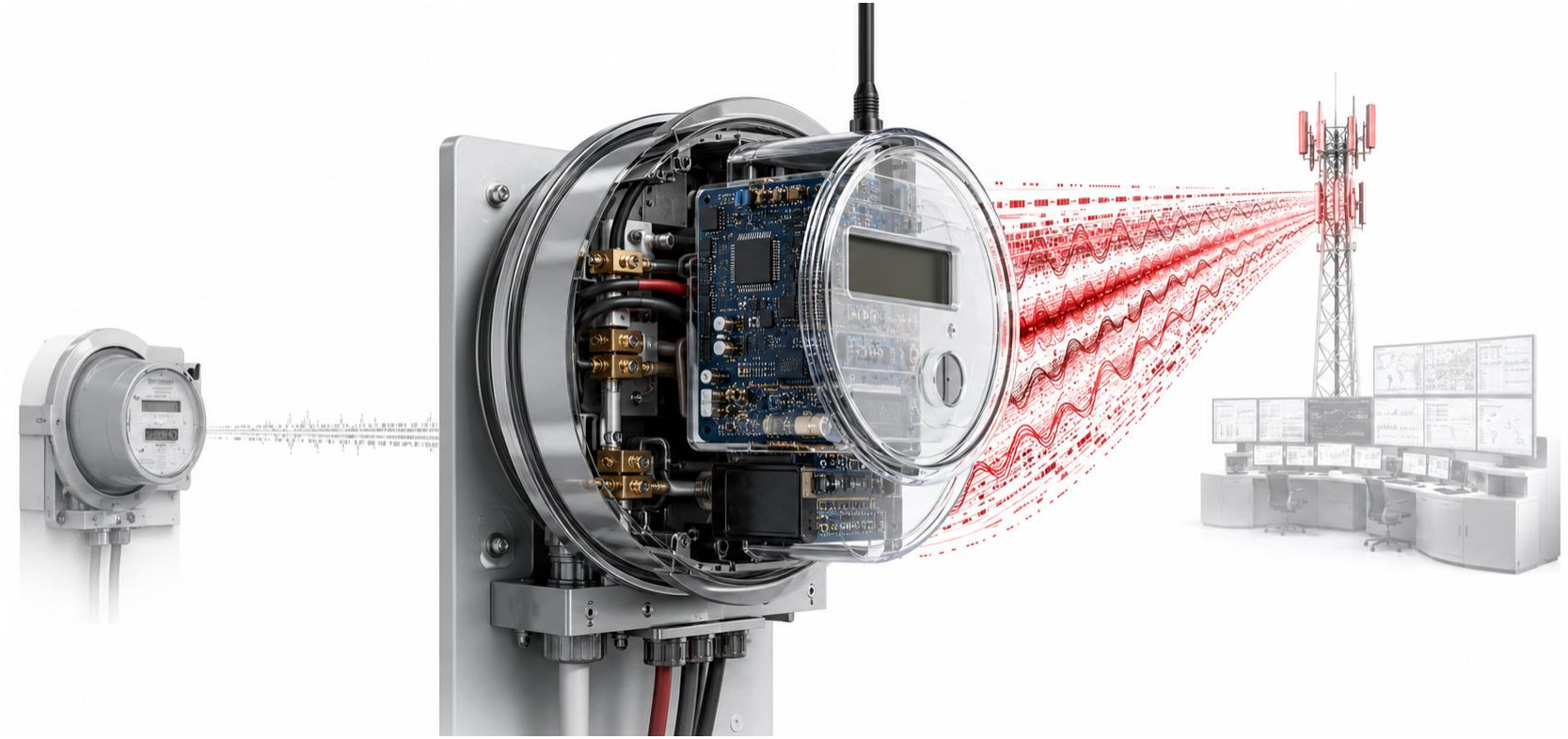
## Meter-to-cash

Periodic reads record consumption for billing.

REAL-TIME

## Grid-edge sensing

Waveforms, telemetry and control turn every meter into an operational sensor.



**100X**

**MORE BANDWIDTH**

Private licensed spectrum supports the data volume of intelligent edge sensing.

# High-Bandwidth Pipe for Edge Computing & OTA Updates

A high-throughput OTA path distributes firmware, security patches and new applications at fleet scale.

PRIVATE LTE

## ONE SECURE PIPE

One managed transport layer updates millions of intelligent endpoints.

**NO TRUCK ROLL**
**NO MESH BOTTLENECK**

### OTA DELIVERY AT FLEET SCALE

01 → 02 → 03

**PACKAGE**

Validate firmware, patches and edge applications.

**TRANSPORT**

Move signed payloads over the private LTE network.

**DEPLOY**

Install consistently across the meter fleet.

### CONTENT DELIVERED

**FIRMWARE • SECURITY PATCHES • EDGE APPS**

**A repeatable release path across millions of endpoints**

# Sub-Second Data Enables Real-Time Grid Control

Private LTE moves continuous waveform, power-quality and voltage data fast enough for real-time balancing.

**READING FREQUENCY**

**AMI 1.0**

## 15–60 MIN

Delayed interval reads

**AMI 2.0**

## < 1 SEC

**Continuous operational data**

**CONTINUOUS DATA STREAMS**

01 **WAVEFORM DATA**

Sub-second electrical signatures reveal grid behavior.

02 **POWER QUALITY**

Continuous metrics expose disturbances and degradation.

03 **VOLTAGE**

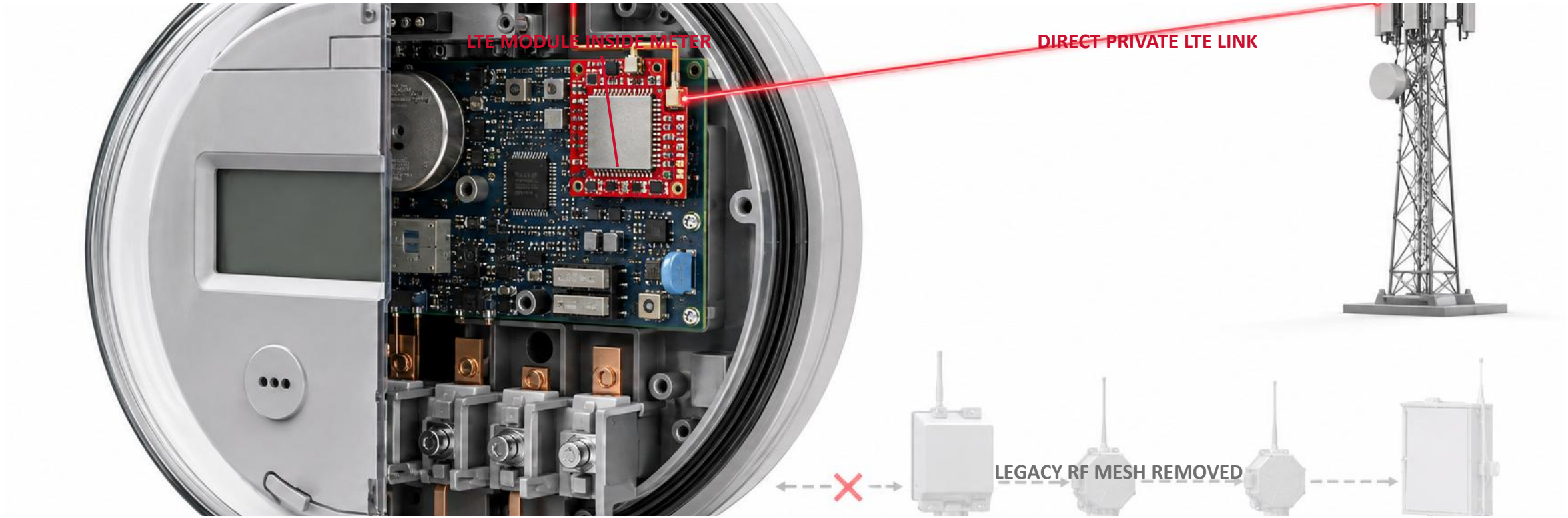
Granular measurements support dynamic balancing.

**OPERATIONAL IMPACT**

**Low latency makes real-time grid balancing possible.**

# Under-Glass LTE Removes Mesh Complexity

A cellular module inside the meter connects directly to the utility-owned private LTE network.




**01 FEWER DEVICES**

No intermediate collectors or routers

**02 FEWER FAILURE POINTS**

Simpler communications architecture

**03 FASTER TWO-WAY RESPONSE**

Direct cellular path to the meter

# Private LTE coordinates DERs and EV loads

Low-latency two-way control aligns solar, storage and charging with grid conditions.

**SCHEDULE EV LOADS** | **DISPATCH STORAGE** | **MANAGE TWO-WAY FLOW**

**COORDINATION OUTCOME**

## Local resources respond to grid needs—not independently of them.

# Critical Alerts Reach Operations Immediately

Private LTE carries last-gasp outage and safety warnings without mesh-hop or public-network delays.


**GRID-EDGE EVENTS**

**ARCING • OVERHEATING • HIGH-IMPEDANCE FAULTS • OUTAGE**

# AMI Discussion

# TESCO AMI Solutions: Zero-Infrastructure AMI

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**WIRELESS MESH NETWORK**
Self-healing. Self-optimizing. Built for reliability.

**UNIVERSAL SIM CARD**
Multi-carrier connectivity. Always find a live connection.

**RELIABLE & SECURE**
Advanced security from meter to system.

**SCALABLE & FLEXIBLE**
Designed to grow with your utility.

**BUILT FOR UTILITIES**
Purpose-built for performance, accuracy, and service.

# DirectConnect closes hard-to-reach AMI gaps

Under-glass LTE delivers always-on cellular connectivity in supported Gen 5 Aclara kV2c meters.

UNDER-GLASS LTE

## TESCO DirectConnect™


LTE MODULE INSTALLS INSIDE THE METER

UNIQUE SELLING PROPOSITION

**Reach meters RF-based AMI networks cannot—without adding collectors, routers or communications infrastructure.**

01 **BRIDGE COVERAGE GAPS**

Connect hard-to-reach meters directly over LTE.

02 **RETIRE 2G / 3G**

Replace unsupported legacy cellular devices.

03 **DEPLOY PLUG-AND-PLAY**

Install inside supported meters—no external network gear.

**GEN 5 ACLARA kV2c • LTE CAT-1 • AT&T + VERIZON • ANSI C12.22 AES/EAX**

# The Challenge

Coverage gaps, cellular sunsets and fleet complexity disrupt reliable access to meter data.

**WHERE IT BREAKS**

**COVERAGE + GEOGRAPHY**

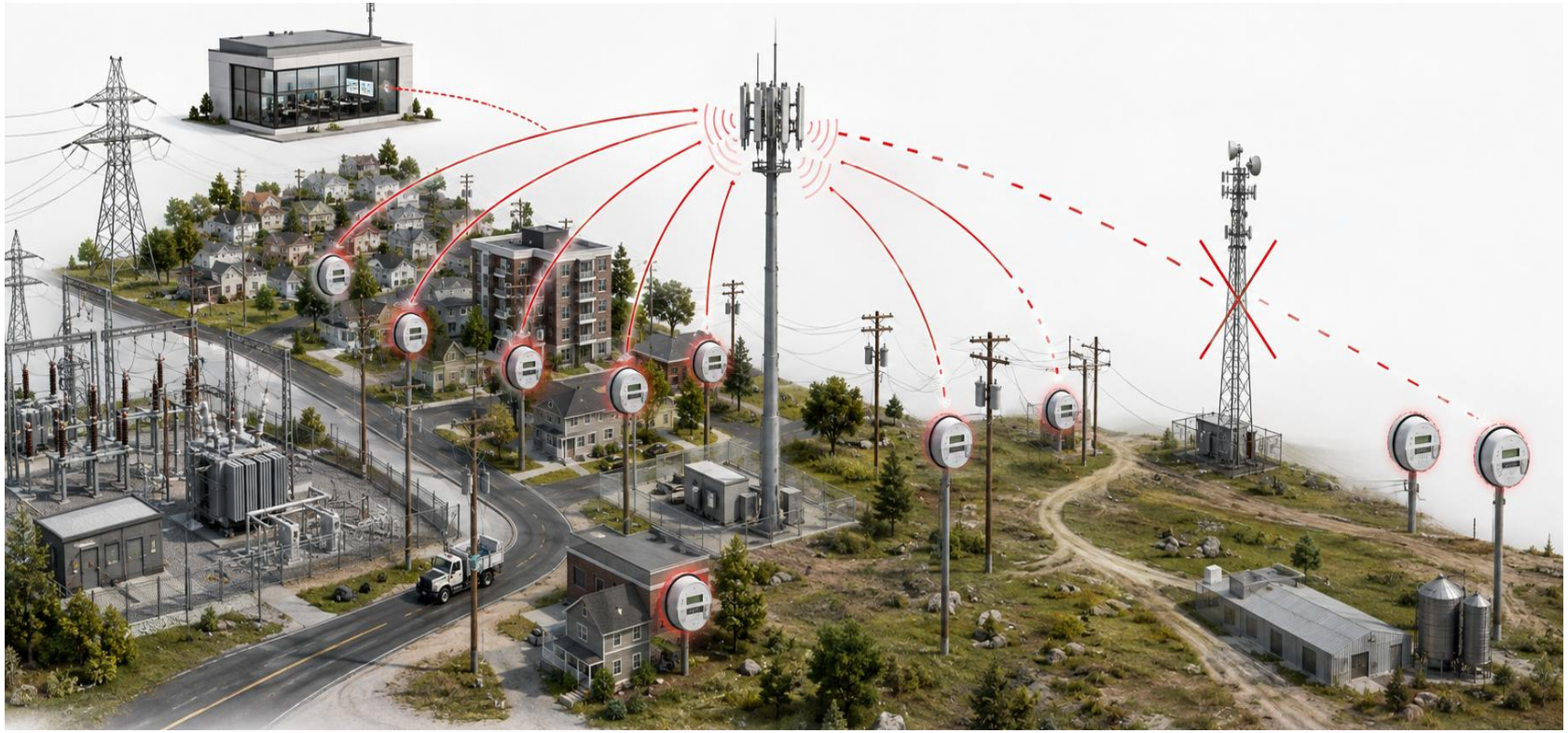
## Coverage fails

Remote Oncor meters in Midland / Odessa need an alternate path.

**LEGACY + SCALE**

## 2G / 3G age out

Unsupported devices and SIM administration compound risk across million-meter fleets.



**RISK**

**INCOMPLETE VISIBILITY**

Coverage gaps delay meter data, system status and outage response.

# How DirectConnect™ Works

Under-glass LTE links supported Aclara kV2c meters directly to utility systems.

INTEGRATED LTE

## TESCO DirectConnect™


LTE MODEM INSTALLS UNDER GLASS

DIRECT CONNECTION SEQUENCE

**Install under glass. Connect directly over LTE. Access meter data and status remotely.**

01 **INSTALL UNDER GLASS**

Plug-and-play into supported Gen 5 Aclara kV2c meters.

02 **CONNECT OVER LTE**

True IP passthrough provides a direct cellular path.

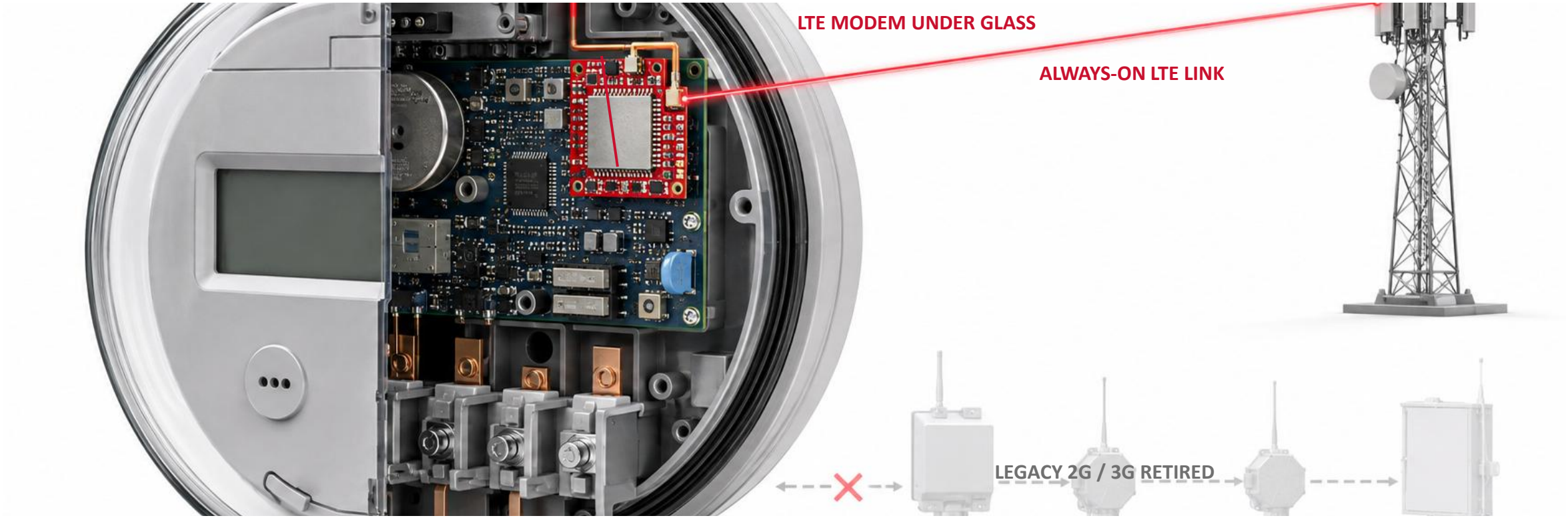
03 **ACCESS REMOTELY**

Meter data and device status remain continuously available.

**GEN 5 ACLARA kV2c • LTE CAT-1 • TRUE IP PASSTHROUGH • ALWAYS-ON ACCESS**

# DirectConnect™ Improves AMI Performance

Under-glass LTE closes coverage gaps, retires legacy cellular and keeps meter data available.




**01 EXTEND COVERAGE**

Reach meters in communication gaps

**02 MAINTAIN VISIBILITY**

Continuous meter data and real-time status

**03 IMPROVE OPERATIONS**

More online meters. Fewer field interventions

# DirectConnect™ Secures Data & Integrations

ANSI C12.22 encryption protects two-way LTE traffic and connects to established utility software.

SECURE BY STANDARD

## 128-BIT AES/EAX

ANSI C12.22 encryption protects meter data in transit.

**TWO-WAY LTE OPEN SYSTEM COMPATIBILITY**

SECURE METER-TO-SYSTEM PATH

01 → 02 → 03

### PROTECT

Encrypt reads, events and commands with ANSI C12.22 AES/EAX.

### COMMUNICATE

Move meter data and control signals bidirectionally over LTE.

### INTEGRATE

Connect to existing meter data and head-end systems.

SUPPORTED SYSTEMS

**MV-90™ • METERMATE® • UNITYSUITE® • PRIMEREAD®**

**Compatible with Itron, Aclara and Trilliant platforms**

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# Compatibility & Applications

Built for supported Aclara kV2c configurations and hard-to-reach AMI locations.

**TWO REQUIREMENTS. ONE DEPLOYMENT DECISION.**

METER COMPATIBILITY

## Fits the meter

Designed for Gen 5 Aclara kV2c meters across Class 20, CL200 and Class 320 forms.

**KYZ board and Viking connector options support deployment flexibility.**

FIELD APPLICATIONS

## Reaches the hard-to-reach

Use DirectConnect for AMI coverage gaps, rural routes and isolated meter locations.

**Add LTE connectivity where the primary AMI network cannot reach.**

01 **MATCH THE METER**

Select the supported meter form and connector option.

02 **FILL THE GAP**

Deploy in rural and remote service locations.

DEPLOYMENT OUTCOME

**Extend AMI reach without redesigning the meter environment.**

# QUESTIONS AND DISCUSSION

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